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1883

Chas. L. ...

REPORT

—OF THE—

CHIEF COMMISSIONER OF HIGHWAYS

FOR THE YEAR 1883,

With an Appendix containing

SPECIFICATIONS FOR THE YEARS 1883 AND 1884,

—AND THE—

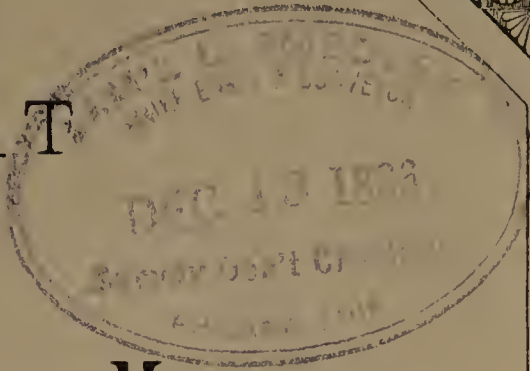
Report of the Board of Experts

—ON—

STREET PAVING.

PHILADELPHIA:

DUNLAP & CLARKE, PRINTERS, HASTINGS' BUILDING, 819 & 821 FILBERT ST.
1884.



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TABLE OF CONTENTS.

	PAGE
Committee on Highways, 1883-1884.....	5
Officers and employees.....	6
Receipts.....	9
Appropriations and expenditures.....	11
Pavements, Repairs.....	17
Pavements, New	19
Bridges, repairs of	20
Street cleaning.....	21
Removal of snow.....	24
Sewers, repairs of.....	25
Sewers, amount of contracts for repairs to, in 1883.....	25
Sewers, amount of contracts for repairs to, in 1884.....	25
Sewers, construction of.....	26
Inspection	28
Tabulated statement, showing sewers constructed in 1883.....	28
Tabulated statement, relative to paved and unpaved streets, street cleaning, population, etc.....	34
Total length and area of streets.....	42
Tabulated statement of the amount of travel on various streets.....	43
Forms of proposal and specifications for repairing sewers and inlets, and clean- ing sewers and inlet-necks, for the year 1883.....	45
Forms of proposal and specifications for furnishing crossing, tramway, and gutter stones, for the year 1883.....	47
Forms of proposal and specifications for repairing paved streets, for the year 1883..	49
Forms of proposal and specifications for repairing unpaved streets, for the year 1883.	53
Form of proposal for cleaning streets, inlets, and market houses, and removing ashes and dead animals, for the year 1883.....	57
Form of proposal and specifications for removing kitchen garbage and offal, for the year 1883.....	58

	PAGE
Street cleaning districts.....	64
Estimate for appropriation, for the year 1884.....	72
Amounts appropriated, for the year 1884.....	75
Form of proposal and specifications for furnishing and delivering crossing, gutter, and tramway stones, for the year 1884.....	77
Form of proposal for repairing sewers, inlets, and inlet-necks, and cleaning sewers and inlet-necks, for the year 1884.....	80
Form of proposal and specifications for the maintenance of unpaved highways, macadamized public highways, and small bridges and drains, for the year 1884.....	82
Form of proposal and specifications for repairing paved streets, for the year 1884...	88
Form of proposal for collecting and removing kitchen garbage and offal, for the year 1884.....	92
Form of (revised) proposal and specifications for cleaning streets, inlets, and public market houses, for the year 1884.....	96
Report of the Board of Experts, on street paving.....	110

COMMITTEE ON HIGHWAYS.

— 1883. —

Common Council.

DAVID WALLACE (*Ch'n*),
CHARLES W. HENRY,
U. C. SMITH,
JAMES MORAN,
CHARLES LAWRENCE,*
JOHN L. GRIM,
JACOB GRIM,
HENRY H. WISLER,
A. ATWOOD GRACE,
GEORGE H. HOFFMAN,
JOHN M. VANDERSLICE,
CHARLES E. WEBSTER.

Select Council.

CHARLES H. BANES,
JOHN K. CUMING,
JAMES EVANS,
JOHN H. GRAHAM,
ALONZO SHOTWELL,
PETER MONROE,
A. HALLER GROSS,
WILLIAM THORNTON,
WILLIAM McMULLEN,
THOMAS J. ROSE,
GEORGE W. HETRICK,
SAMUEL HART.

— 1884. —

Common Council.

DAVID WALLACE (*Ch'n*),
A. ATWOOD GRACE,
U. C. SMITH,
GEORGE H. HOFFMAN,
THOMAS MEEHAN,
JAMES McCORMICK,
CHARLES E. WEBSTER,
JAMES MORAN,
JAMES L. STEWARD,
JOHN STEEN,
JOHN D. HEINS,
DANIEL T. JENKS.

Select Council.

CHARLES H. BANES,
JAMES EVANS,
JOHN H. GRAHAM,
PETER MONROE,
A. HALLER GROSS,
WILLIAM McMULLEN,
WILLIAM THORNTON,
GEORGE W. HETRICK,
SAMUEL HART,
MICHAEL O'ROURKE,
HENRY R. SHOCH,
JOHN L. GRIM.

* Resigned, Ab'm Thompson appointed in his place.

OFFICERS AND EMPLOYEES

OF THE

DEPARTMENT OF HIGHWAYS.

CHIEF COMMISSIONER.

JOHN D. ESTABROOK.

Assistant Commissioners.

<i>First District,</i> WILLIAM R. GREEN. <i>Second " "</i> THOMAS GILLIGAN. <i>Third " "</i> John B. WHITE.	<i>Fourth District,</i> WM. C. CRANMER. <i>Fifth " "</i> JOHN MARTIN, <i>Sixth " "</i> A. R. ROBERTS.*
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Chief Clerk, M. M. COPPUCK.

Assistant Clerks.

Isaac R. Martindell,	Joseph M. Sturges.
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<i>License Clerk,</i> James G. Dixon.	<i>Ass't License Clerk,</i> E. W. Smitheman.
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Miscellaneous Clerk, H. C. Briggs.

Street Superintendents.

<i>First District,</i> M. H. McCarthy. <i>Second " "</i> Charles Boon, Jr., <i>Third " "</i> Andrew M. Shinkel.	<i>Fourth District,</i> Theo. Vanderslice. <i>Fifth " "</i> William Clark. <i>Sixth " "</i> Chas. H. Carpenter.†
---	--

Inspectors.

<i>First District,</i> Michael C. Lyons, " " Aaron F. Stull. <i>Second " "</i> Charles B. Quigley, " " G. R. Tisdall. <i>Third " "</i> John E. Manship, " " Thomas P. Greger.	<i>Fourth District,</i> Henry Eisenbrown, " " William B. Delaney. <i>Fifth " "</i> Jamison Lott, " " Fred'k T. Buckius. <i>Sixth " "</i> Matthew Patton, Jr., " " Jesse C. Henszey.
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Janitor, Wm. S. Mower.

Office Boy, E. H. Brannix.

* Resigned June 11, 1884.

† Appointed Assistant Commissioner, in place of A. R. Roberts, resigned. Robert C. Hicks, appointed Street Superintendent, in place of Charles H. Carpenter.

Engineers Penrose Ferry Bridge.

J. F. Husted, Robert Kerr.

Watchmen Penrose Ferry Bridge.

George W. Bosler, Robert W. Sampson, Jos. Rivel, Samuel Banning.

Watchmen Market Street Bridge.

John Murphy, Davis Marshall, John Conway, Edward Gilligan.

Watchmen Callowhill Street Bridge.

George Kochersperger, Samuel Adair, William H. Lenoir,
William J. Wheeler.

Watchmen Girard Avenue Bridge.

William Wagner, Jr., Henry Pedrick.

Watchmen South Street Bridge.

Patrick Brearty, William McFarland, Daniel McElwee, James Carr,
John A. Catanach, Joseph Bergantz.

Watchman Bridesburg Bridge.

Joseph N. Jarboe.

Watchmen Falls Bridge.

Charles D. Wortz, Samuel Wynn.

Watchman Orthodox Street.

Daniel D. George.



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ANNUAL REPORT
OF THE
CHIEF COMMISSIONER OF HIGHWAYS,
FOR THE YEAR 1883.

Philadelphia, February 27, 1884.

HON. SAMUEL G. KING,
Mayor of the City of Philadelphia.

SIR:—The Chief Commissioner of Highways has the honor to submit the following report, for the year 1883.

Improvements and repairs to the highways, however urgent, can be made only when appropriations therefor exist, and when Councils have authorized the specific work in question. The Chief Commissioner has no discretionary power in advance of such legislation.

Liabilities incurred by the Highway Department are payable from specific appropriations in warrants on the City Treasurer. Moneys received by the department from various sources cannot be paid out again for labor or material, but must be turned into the City Treasury twice each week.

Receipts, 1883.

During 1883, the total cash receipts were \$49,580.50.

Mr. J. G. Dixon, the License Clerk, has prepared the following table, which shows in detail the amounts received in each of the past eight years.

Since 1880, a fee of \$5 has been collected for each permit issued during the winter months for breaking streets that are paved.

TABLE.—Showing the receipts of the Department of Highways from various sources, from 1876 to 1883, inclusive.

	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.
Permits to break streets.....	\$222 00	\$186 00	\$168 00	\$225 00	\$401 00	\$1,234 00	\$1,306 00	\$1,567 00
Sewer rents.....	26,844 85	56,494 31	64,766 45	10,759 75	3,894 00	665 00	440 00	133 00
Sewer assessments.....	6,254 25	2,065 02	4,327 77	2,566 90	4,217 87	5,585 94	2,453 54	1,165 14
Dray, cart, wagon, and barrow licenses.....	1,659 25	2,037 50	2,507 50	1,310 75	2,271 00	2,302 25	1,970 25	2,324 00
Building permits.....	542 00	613 00	516 00	476 50	478 51	683 75	570 75	709 75
Vault permits.....	703 00	359 17	788 50	935 00	1,164 00	1,353 00	1,568 47	1,240 00
Hackney coach licenses.....	3,922 50	920 00	760 00	840 00	440 00	555 00	820 00	925 00
Miscellaneous receipts.....	760 57	338 07	344 35	454 75	215 90	397 50	97 00	243 00
Passenger railway licenses.....	39,603 79	42,650 00	38,387 49	38,974 99	40,192 62	40,737 50	40,929 17	40,836 51
Omnibus licenses.....	560 00	.....	.....	225 00	1,165 00	1,250 00	800 00	100 00
Railroad turnouts.....	.....	16 00	.....	30 00	30 00	.....	.....	.....
Tolls city railroads.....	7,022 80	5,815 30	6,179 46	5,892 83	4,753 67	2,061 14	.....	.....
Drivers' licenses.....	1,572 00	660 00	365 00	345 00	200 00	135 00	220 00	337 50
Totals	\$89,667 01	\$112,154 37	\$119,110 52	\$63,036 47	\$59,322 56	\$56,960 08	\$51,175 18	\$49,580 90

Sewer rents were abolished by Ordinance of Councils, December 31, 1878, causing a material decrease in the receipts since that date.

This yields annually a revenue of about \$1,000 in addition to that received for miscellaneous permits.

Formerly rents were collected by the Highway Department for the use of sewers, which alone yielded an income equal to the present total receipts of the department. About five years ago sewer rents were abolished. Since that date small sums have been annually received in settlement of old sewer rent liens. These sums annually grow less, and will in time entirely cease.

In the summer of 1882 all sewer building was placed under the supervision of inspectors appointed by the Survey Department. This resulted in securing better material and better work, but at slightly increased prices. Payment for sewer building is made chiefly in assessment bills on abutting property, at the rate of \$1.50 per foot front for each side of the street, or \$3 per linear foot of sewer, except for street intersections, exempt property, abatements, and the like. In rare instances assessment bills aggregate more than the total cost of the sewer. In such cases assessment bills in excess of the cost are collected by the Highway Department and paid into the City Treasury.

When the inspection of sewer construction was less rigid, prices for sewer building were lower, and more revenue could be paid into the City Treasury from assessment bills; but the cheaply-built sewers have proved to be far from satisfactory.

During the past year fewer permits were issued for the construction of vaults under sidewalks, and fewer licenses were issued for omnibuses. An increased number of licenses were issued for wagons, coaches, and drivers. More building permits were also issued, and receipts from miscellaneous sources were increased beyond the previous year.

Appropriations and Expenditures, 1883.

The following statement was prepared by the Chief Clerk, Mr. M. M. Coppuck, and gives in detail the appropriations and expenditures for the year 1883.

Annual Appropriation to and Expenditures by the Department of Highways, for 1883.

Items.	Appropriation.	Expended.	Balance merging.	Balance not merging.
1	Officer's salaries.....	\$26,528 47	\$157 59	
2	Paving intersections.....	12,491 95	7,758 45	\$4,129 98
3	Repairs to paved streets.....	173,456 65	169,229 80	934 63
4	Repairs to meadow banks.....	500 00	491 64	8 36
5	Repairs to unpaved streets and roads.....	32,816 29	32,764 30	51 99
6	Grading streets and roads.....	37,456 65	26,933 95	11 40
7	Repairs to bridges.....	36,935 72	26,284 25	10,511 30
8	Repairs to sewers and inlets.....	17,500 00	16,641 36	10,496 24
9	Printing, advertising, and stationery.....	6,600 00	6,590 18	858 64
10	Insurance on bridges.....	1,333 75	490 00	9 82
11	Incidentals, and office and yard expenses.....	5,000 00	4,437 48	843 75
12	Street index boards.....	580 00	387 51	562 52
13	Repairs to passenger railway streets.....	3,000 00	2,965 71	67 68
14	Salaries of bridge watchmen.....	16,770 00	16,746 03	34 29
15	Grading, curbing, and repairing footways.....	5,125 00	4,049 56	23 97
16	Constructing branch sewers.....	17,402 46	16,595 57	124 31
	Amounts carried forward.....	\$393,496 94	\$7,422 35	189 83
				\$27,337 92

Appropriations, Expenditures, etc.—Continued.

Items.	Appropriation.	Expended.	Balance merging.	Balance not merging.
	Amounts brought forward.....	\$358,736 67	\$7,422 35	\$27,337 92
17	Constructing new inlets.....	5,000 00	336 11	
18	Crossing and tranway stone.....	26,041 02	2 56	169 98
19	Keep of horses for Chief Commissioner of Highways.....	944 43		
20	Keep of horses for Assistant Commissioners of Highways.....	3,000 00	0 48	
21	Oil, coal, and Engineer's stores, Penrose Ferry Bridge.....	1,290 00	1,283 08	6 92
22	Repairs to Oxford and Roxborough turnpikes.....	10,000 00	5,000 00	5,000 00
23	One-half bridge over Cobb's creek.....	400 00	400 00	
24	Cleaning streets, removing ashes, garbage, etc.....	287,468 99	274,449 77	12,926 51
25	Emergencies.....			
26	Repairs to Long lane.....	7,500 00		7,500 00
27	Main sewer on York street.....	20,000 00	13,011 84	6,988 16
28	Constructing main sewers.....	1,938 98	1,917 20	21 78
29	Macadamizing Weccacoe avenue.....	11,674 97	6,229 50	5,380 40
30	Repairs to Woodland avenue.....	20,000 00		20,000 00
31	Repaving Poplar street with Belgian blocks.....	9,654 57		9,654 67
	Brought from books of 1879.....	3 44	3 44	
	Totals	\$798,413 44	\$8,351 42	\$94,957 64

Appropriations, Expenditures, etc.—Continued.

Items.	SPECIAL APPROPRIATIONS.	Appropriation.	Expended.	Balance merging.	Balance not merging.
	Amounts brought forward.....	\$798,413 44	\$695,104 38	\$8,351 42	\$94,957 64
2	Main and intercepting sewers. (Ordinance, June 21, 1882.).....	197,146 42	92,904 00	.....	104,242 42
3	Repaving with Belgian and improved pavement. (Ordinance, June 21, 1882.)..	140,300 00	109,081 90	.....	31,218 10
4	Bridge at Market street, Schuylkill. (Ordinance, June 21, 1882.).....	275,000 00	.....	.....	275,000 00
5	Repairs to Chestnut Street Bridge. (Ordinance, June 21, 1882.).....	50,000 00	155 25	.....	49,844 75
7	Constructing branch sewers. (Ordinance, June 21, 1882.).....	4,023 62	2,999 31	.....	1,024 31
	Rebuilding bridges, Twenty-third Ward. (Ordinance, March 9, 1883.).....	12,000 00	11,010 00	.....	990 00
1	Main sewer, York street. (Ordinance, March 24, 1883.).....	25,000 00	.....	.....	25,000 00
2	Orthodox Street Bridge. (Ordinance, March 24, 1883.).....	30,000 00	.....	.....	30,000 00
3	Permanent improvement, South Street Bridge. (Ordinance, March 24, 1883.)..	15,000 00	.....	.....	15,000 00
	Repairing bridges. (Ordinance, May 28, 1883.).....	5,029 95	5,029 95	.....	.....
	Relief of William H. H. Aehuff. (Ordinance, June 29, 1883.).....	3,460 00	3,460 00	.....	.....
	Repaving streets occupied by Pass. Railway Cos. (Ordinance, March 28, 1883.)..	847 08	847 08	.....	.....
	Remacadamizing South Broad street. (Ordinance, September 29, 1883.).....	24,500 00	21,907 55	.....	2,592 45
1	Constructing branch sewers. (Ordinance, October 8, 1883.).....	24,400 00	17,697 25	.....	6,702 75
2	Rebuilding two bridges in Twenty-third Ward. (Ordinance, October 5, 1883.)..	6,200 00	6,115 00	.....	85 00
	Amounts carried forward.....	\$1,611,320 51	\$966,311 67	\$8,351 42	\$636,657 42

Appropriations, Expenditures, etc.—Continued.

Items.	SPECIAL APPROPRIATIONS—Continued.	Appropriation.	Expended.	Balance merging.	Balance not merging.
	Amounts brought forward.....	\$1,611,320 51	\$966,311 67	\$8,351 42	\$636,657 42
	Bridge over Connecting Railroad. (Ordinance, October 5, 1883.).....	12,000 00	.....	.....	12,000 00
	Repairs to meadow ditches, First Ward. (Ordinance, December 22, 1883.).....	1,152 92	.....	.....	1,152 92
	Repaving Poplar street. (Ordinance, December 17, 1883.).....	6,800 00	.....	.....	6,800 00
	Main sewers. (Loan Ordinance, October 14, 1872.).....	347 48	.....	.....	347 48
	Main sewers. (Loan Ordinance, July 13, 1875.).....	2,698 21	.....	.....	2,698 21
	Totals	\$835,905 68	\$271,207 29	.....	\$564,698 39
	Grand Totals.....	\$1,634,319 12	\$966,311 67	\$8,351 42	\$659,656 03

Appropriations are divided into two classes, that may be termed "Annual" and "Special;" the first being from the current tax levy, and the second from the surplus of previous years. From the tax levy of 1883 the appropriation to the Highway Department was \$798,413.44. Payments from the same were \$695,104.38. To meet liabilities under existing contracts, there was carried forward at the end of the year \$94,957.64, and there was merged into the surplus for the new year \$8,351.42. Two sums allowed to merge were due under contracts, but payment was withheld because the same contractor was a defaulter on other work for the city. Other sums that merged were reserved by the Highway Department for payment of insurance on bridges, and other bills that the City Controller declined to countersign.

In addition to the above named sums in the annual appropriation, there was, from the surplus, to the credit of the various Highway items, during the year 1883, the sum of \$835,905.68, and of this there was expended \$271,207.29, which left an unexpended balance at the close of the year of \$564,698.39, made up chiefly of the following items:

Manayunk Sewer, -	-	-	-	\$104,242	42
Other sewers, -	-	-	-	34,227	46
Market Street Bridge, -	-	-	-	275,000	00
Chestnut Street Bridge, -	-	-	-	49,844	75
Orthodox Street Bridge, -	-	-	-	30,000	00
South Street Bridge -	-	-	-	15,000	00
Connecting Railroad Bridge, -	-	-	-	12,000	00
Improved pavements, -	-	-	-	37,018	10

Tables on the previous pages show the several items more in detail.

Balances of items in the annual appropriation unexpended at the close of the year, merge, unless otherwise specially provided by ordinances of Councils.

Balances of appropriations from loans, or the surplus, do not merge.

The annual appropriation to the department usually provides for cleaning streets and routine repairs to paved and unpaved streets and roads ; but the grading and paving of streets, the construction of main and branch sewers, and special work of any nature must be specifically provided for by separate ordinances.

With rare exceptions, all work is done by contract, after advertising ten days and awarding contracts to lowest bidders.

Pavements, Repairs.

In previous years contracts have been made for repairs to paved streets for a gross sum ; the contractors running all risk of the amount of work to be done. In the spring of 1883 the paved streets throughout the city were notably in bad condition and required very extensive repairs ; both streets with and without passenger railways.

Railway companies are required to maintain the pavements, from curb to curb, in all streets they occupy, with the possible exception of two or three streets still in dispute and to be determined by the Courts, where railway companies claim exemption from maintenance by reason of having acquired the right of way from old turnpike companies. The railway companies generally did a large amount of work, and soon put their streets in fair condition, but did use, or permit the use of, an excessive amount of loamy gravel on the surface of repaired streets, thus making dust in dry weather, and mud when it rained.

Trouble was experienced in getting repairs made to paved streets, other than railway streets, at reasonable prices. Contractors would not undertake the work for a gross sum within the limit of funds available ; consequently, bids were received for doing the work by the square yard, and the appropriation for pavement repairs was apportioned between the several wards of the city. In some wards, the prices bid were very reasonable, and contracts were at once entered into for such wards. In the lower section of the city the lowest bids received were exorbitant, and the work was re-advertised. Again, the lowest bids were too high, and the work was advertised a third time, which gave

bids but little more than one-half the lowest bids under previous advertisements. The work was then let at these lowest figures, which were still higher than seemed necessary for the work, but too much time had already been spent in repeatedly advertising, and further delay was not admissible. The contracts were made under specifications requiring the work and material to be in conformity to existing ordinances, the contractor to make good all deficiencies. New gravel was not to be substituted for old gravel, but was to be added to the old gravel where necessary.

In many places the underlying dirt had to be graded away and removed, to make room for the requisite amount of gravel, and a large proportion of the cobble paving stones had to be condemned and replaced with better stone by the contractor. This gave a smoother, better, and more durable cobble pavement, that stood remarkably well up to the close of the year.

Except where special ordinances so provided, cobble pavement could not be changed for Belgian or other improved pavements.

It was claimed that irregular offers had been made to repair the paved streets at much less than contract prices. Late in the season a small additional appropriation enabled the department to make a few repairs by "day's work," the time then being too short for advertising and contracting for the repairs. It was found that the cost of repairs by "day's work" did not materially differ from the previous contract prices. In some cases the cost was considerably more, and in other cases slightly less.

A party who did much of the work by the day, but none by contract, had previously represented to members of the Highway Committee that he could repair the pavements for 25 cents per yard. Subsequent measurement showed the cost of his work, including gravel and stone for those condemned, was 47 cents, and in one case nearly 70 cents per square yard, clearly disproving his claims to do it for 25 cents.

Making pavement repairs by the square yard enabled the

Highway Department to say what streets should be first repaired. The endeavor was to have main arteries of connection between the different sections of the city repaired, rather than to patch all streets promiscuously, and have none in good condition. The appropriation did not prove sufficient to make one-half the repairs needed, and by mid-summer, practically, the whole appropriation had been exhausted. At that time it was recommended that authority be given by ordinance to apply to pavement repairs a portion of the sum appropriated for building a bridge across the Schuylkill river at Market street. Plans for the bridge had not then been perfected, and contracts therefor could not be made. Any portion of the funds so used, temporarily, could be replaced from the tax levy of 1884. This proposition, however, did not meet with approval.

An unusual number of breaks were made in paved streets, for repairs to water connections, stop-boxes, laying new water mains, etc., and a large percentage of the expenditure for pavement repairs had to be made for paving over such breaks.

Pavements, New.

Telford or Macadam pavements were put down or entirely resurfaced, in the following streets:

Weccacoe avenue, from Swanson street to Greenwich Point Railroad.

South Broad street, from Passyunk avenue to League Island.

Long lane, from Mifflin street to Snyder avenue.

Woodland avenue (partly completed), from Fifty-second street to Cobb's creek.

Twenty-second street, from Spruce to Hamilton.

Hamilton street, from Twenty-second to Twenty-fifth.

Ridge avenue (graded and resurfaced), from Manayunk, Main street, to Terrace street.

Germantown avenue (nearly completed), from Gorgas street to Chestnut Hill.

Old Second street (resurfaced), from Newtown Railroad nearly to Rock run.

Small amounts of Belgian pavements were laid in various streets, and an improved asphalt sheet pavement was laid on North Broad street, from Columbia avenue to Diamond street.

The appended tables give items of information that should be recorded, and that will be convenient for reference hereafter.

Bridge Repairs.

In previous years repairs to all bridges had been included in contracts for the maintenance of country roads; but in 1883 such contracts were restricted so as to exclude bridges exceeding eight feet clear span.

Many bridges that appeared on the surface to be sound, proved upon further examination to be much decayed in less conspicuous but equally essential parts. The strength of a bridge depends upon its weakest part, not upon its general condition.

The large wooden bridge over the Schuylkill at Falls Village, was supplied with an entire new floor and floor joists. The permanent load on the oldest of the three spans was reduced about 15 tons, by substituting a single thickness of new plank for three thicknesses of decayed plank. The large bridge on Walnut lane, Germantown, was similarly repaired, adjusted, and painted. Extensive repairs were made to numerous small bridges in the First, Twenty-fourth, Twenty-second, Twenty-fifth, and Twenty-third Wards. In the Twenty-third Ward, bridges destroyed by high water in 1882, were entirely rebuilt.

Many needed repairs to bridges had to be postponed for want of funds.

The small appropriation for rebuilding the western approach to South Street Bridge was insufficient to be profitably used, until more could be added to it. Repairs to the draw-span of South Street Bridge were postponed until navigation should be closed by ice. They were completed early in 1884.

Work on bridges at Market, Chestnut, and Orthodox streets was postponed for a more careful determination of what was needed in each case.

The cartway of the bridge over the railroad at Summit street, Chestnut Hill, was rebuilt at a very low price. The contractor promptly completed his work in accordance with the contract, and to the satisfaction of the department and Committee; but by reason of false and persistent reports that the repairs were unnecessary, and were improperly made, the contractor was unable to secure payment until late in November, though he had completed his work in August.

Street Cleaning.

Street cleaning proposals for 1883 were invited by advertisement in January. The lowest bids received for the several districts aggregated more than the appropriation available, and contracts could not be legally made. March 2, an additional appropriation was made sufficient for the deficiency, and contracts were immediately awarded under January bids. So much time had, however, lapsed since the opening of bids that the department could no longer compel bidders to accept awards. Some accepted, and some declined. The districts where the bidders declined were at once re-advertised, which gave bids again in excess of funds available. March 29, a second deficiency appropriation was made, and the department was enabled for the first time to have work commenced in all the districts. A little later, the contractor for cleaning the Thirteenth and Fourteenth Wards, who had been one of the first to accept and commence work, but had neglected, after repeated notice, to enter security, failed to do his work properly, and was, on April 24, declared a defaulter. This involved a third advertisement, and a third deficiency appropriation, that was not finally passed until May 28, when the last contract could be made. Each re-advertisement proved conclusively that no contingent fund available was sufficient to meet the deficiencies.

People clamored for prompt action and clean streets. Councils alone held the power, since appropriations were insufficient, and the department could not involve the city till sufficient funds were available.

Specifications under which the contracts were made were prepared in 1882, by the then Chief Commissioner of Highways, and were approved by the Highway Committee. A few phrases to make the specifications more clear, but not to change their import, were afterwards added by myself.

No provision was made for carting away snow and ice, or for cleaning streets when covered with snow and ice.

Throughout the city the street pavement is almost exclusively cobblestone, laid on a minimum thickness of red loamy gravel, that readily crushes to fine powder when exposed to pressure between any hard surface, and the wheels of carriages, or the feet of animals. Cobble stones of all sizes are placed loosely in contact, leaving considerable intervening spaces filled with perishable gravel. In pavements just laid these gravel spaces or voids more than equal the stone surface. Some two to six weeks later, depending upon the character and amount of travel, and amount of moisture present, the gravel spaces become worn away below the tops of the stones, and the relative areas of gravel and stone are about as one to six. In short, a cobble pavement is at best, to the extent of ten per cent. of its surface, a dirt road, and in wet weather, to a like extent, a mud road. Escape of frost, or continued rain, must bring mud to the surface, not only from between the stones, but from the crushed gravel beneath, wherever water is present and the pavement is exposed to travel. If the pavement be well cleaned, and then exposed to heavy traffic for two hours in wet weather, it will be smeared with mud again.

Much could be done by citizens generally in the preservation of the cleanliness of the streets. Contracts provide for the removal of sweepings by the ash collector, when properly

placed in vessels on the sidewalks, but servants, porters, shop boys, clerks unpacking merchandise, drivers of delivery wagons, hucksters, fruit dealers, and others, find it more convenient to sweep dirt and rubbish into the streets than to put it aside for the ash man. During the past summer it was not an uncommon sight, in many business streets, to see the gutters filled with store sweepings an hour behind the street cleaners.

The system of annual contracts for street cleaning is not satisfactory. In this, as in other business, both general and local knowledge are necessary to success. Proper tools for gathering the dirt, and vehicles for its transportation cannot be had at a day's or a month's notice, and considerable original outlay is demanded. Before a contractor can properly equip himself for doing the work, the first year has half expired; and were he to buy tools and vehicles, such as he should provide for the work, he would very likely be compelled to sell them at the close of the year at a great loss. Consequently, make-shifts of various kinds are employed, and the contractor depends upon such dirt carts as he can hire, to transport his material. These will not hold liquid mud scraped from the streets in wet weather. It perhaps may be moved from a single square, but when transportation begins, the mud streams from all the joints and is smeared over the pavement again as the cart moves on. Were the contract to be annulled, and the work re-advertised, there would be little hope of securing better plant, for it does not exist in the city in sufficient quantity.

Whenever the city will provide sufficient funds, specifications can readily be drawn requiring streets to be cleaned in wet weather, and the material to be removed in water-tight carts; but the cost of the work will be considerably increased. To attempt to compel contractors to do so, when it is not distinctly required by their contracts, must result in failure and loss to the city. Again, to remove snow and ice from the streets, and clean streets when covered with snow and ice, is possible; and provision for such work can readily be made in specifica-

tions and contracts. The cost of such work would, however, be great, and that has heretofore been the reason for excluding it from the specifications.

Better paved streets, with, so far as possible, cemented joints, would greatly diminish the amount of street cleaning necessary.

In the spring, six or eight weeks' accumulation has often to be removed, when not only the dirt itself is in its worst possible condition, but the pavements and dumping grounds are almost impassable for carts hauling dirt. Unless the specifications unequivocally state that the whole accumulation shall be removed in a single week, regardless of the condition of the weather, reasonable forbearance should be exercised so long as contractors exhibit an endeavor to do the work.

Removal of Snow.

During periods of heavy snow, miscellaneous travel on passenger railway streets is seriously interrupted. Legislation appears to make it the duty of railway companies to remove the snow. The railway companies claim that it would take all the vehicles in the city thirty days to remove one foot of snow from the railway streets, even if a place could be found to dump the vast amount that would thus be accumulated. The Highway Department notifies the railway companies to remove the snow; but, in case of failure by the railway companies, it has no power to do the work. The railway companies claim that compliance with the law is impracticable, and consequently do scarcely anything to make the streets passable, except along their rails. Further legislation, requiring the railway companies to compact the snow and maintain a practicable passage way for vehicles on each side of their tracks, to remove the snow, if necessary, for the accomplishment of such purpose, and in case of failure by the railway companies, to authorize the Department of Highways to do the same, would seem to be wise.

If roads be broken along each side of the railway track while snow is falling, and again soon after it has ceased to fall, public travel would thereafter keep them open, with perhaps the need for an occasional leveling of snow at special points.

Require railway companies to do what is practicable, and, if they fail, let the Highway Department do work at their expense; and more will be accomplished than by imposing any amount of penalty that can only be collected by process of law.

The practice of dumping snow in wide streets and avenues is a great nuisance, and should not be permitted. If snow is to be hauled away it should be dumped at points in or near the two rivers, so that its melting will not do harm.

Repairs to Sewers.

Contracts are made annually to repair all sewers not exceeding four feet in diameter; to clean so much of said sewers as may be ordered by the department, and to repair inlets, inlet necks, manholes, and well holes. A gross sum is named in each contract for a certain district, and the contractor assumes the risk of more or less work being necessary during the year.

Contracts as above, for repairs to sewers, were as follows:

For 1883 (nine months, March 30, to December 30).

Sewer repairs east of the Schuylkill river, and north of Market street.....	\$4,890 00
Sewer repairs east of the Schuylkill river, and south of Market street.....	3,500 00
Sewer repairs west of the Schuylkill river.....	1,489 00

\$9,879 00

Prior to the date of the contracts, there was paid.....	5,555 17
For repairs to main sewers, there was paid.....	1,207 19

Total expenditure for 1883..... \$16,641 36

For 1884 (twelve months), contracts have been made for

Sewer repairs in the 21st, 22d, 28th, and 29th wards.....	\$1,873 00
Sewer repairs in the 16th, 17th, 18th, 19th, 20th, 23d, 25th, and 31st wards.....	3,333 00
Sewer repairs in the 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, and 15th wards.....	3,000 00
Sewer repairs in the 1st, 2d, 3d, 4th, 26th, and 30th wards....	3,000 00
Sewer repairs in the 24th and 27th wards.....	1,200 00

Total..... \$12,406 00

This is exclusive of the cost of repairs to main sewers exceeding four feet in diameter. Damages that may result to large sewers, by reason of excessive rainfalls, are too uncertain to be contracted for blindly at a gross sum.

Sewer Construction.

The construction of one section of Manayunk Intercepting Sewer, below Girard Avenue Bridge, was completed. Another section to extend under Fairmount forebay and form a temporary outlet into the river near Fairmount Bridge, was commenced. Some delay in the construction of this section was occasioned by want of agreement as to plans, and location of a temporary outlet.

In the Twenty-fourth Ward, a short section of Mill Creek Sewer was built. A smaller main sewer was constructed in Canal street, and still another was commenced in Dauphin street.

Sewers are built by contract, and the builder is required to keep them in repair for a period of three years from date of completion.

Branch sewers were constructed in various parts of the city, as may be seen from the appended list.

Inspection.

The want of a sufficient number of inspectors was seriously felt by the department, and greatly added to the duties and responsibilities of the Chief Commissioner and the Assistant Commissioners.

The total force of the Highway Department, during 1883, available for the supervision of street cleaning and all other branches of out-of-door work, was as follows:

Wm. R. Green, Assistant Commissioner, and one clerk, for the region south of South street, comprising 117 miles of streets; Assistant Commissioner Thos. Gilligan, without help, for the district between South and Poplar streets, comprising 153 miles of streets; Assistant Commissioner J. B. White, and one street superintendent, for the district north of Poplar

street and west of Broad street, including Manayunk and Chestnut Hill, comprising 332 miles of streets; Assistant Commissioner John Martin, and one clerk, for the district north of Lehigh avenue, comprising the Twenty-third and Twenty-fifth Wards, comprising 209 miles of streets; Assistant Commissioner W. C. Cranmer, and one clerk, for the district east of Broad street, from Poplar to Lehigh avenue, comprising 114 miles of streets; Assistant Commissioner A. R. Roberts, and one street superintendent, for the district west of the Schuylkill river, that is, the Twenty-fourth and Twenty-seventh Wards, comprising 135 miles of streets.

Not less than twelve additional men had, in previous years, been employed to inspect work, serve notices, and the like; but, in 1883, funds were not available to pay such force, consequently it could not be employed. It was therefore impossible to properly inspect the work, or determine whether it was faithfully executed or not. Undoubtedly the city lost many times the amount it would have cost in salaries for twelve inspectors.

A railroad company would hardly contract to the lowest bidder, at notoriously low prices, for the maintenance of its roadbed and track, from Philadelphia to Washington, and place but a single inspector in charge of 150 miles of track so maintained. Can there be any more wisdom in requiring a single inspector or commissioner to supervise all work necessary in 150 miles of paved streets?

The several Assistant Commissioners, clerks, and other employes have each served the city faithfully and creditably, and certainly deserve thanks for their services, however much the results accomplished may be short of what would have been desirable and possible had more means been supplied.

When highway work approved by Committees amounts to more than \$3,000,000, and appropriations can be made of only \$925,000, it cannot be expected that all needed work will be promptly done.

Very respectfully,
 JOHN D. ESTABROOK,
Chief Commissioner of Highways.

Sewers built or completed in 1883.

SEWERS.	Name of Contractor.	Date.	Price per lin. foot, exclusive of manholes.	Length in feet.	Paid by Assesme't bills.	Paid by the city.	Total cost.
Amboy street, from Columbia avenue south, 197 feet.....	Wm. B. Murray.....	May 11	\$2 45	234	\$521 00	\$77 30	\$598 30
American street, from Huntingdon to Somerset streets.....	Nester & Shelmire...	Mar. 31	2 20	1,758	3,887 00	137 60	4,024 60
Baker street, from Mulberry street to Green lane.....	W. B. M. Conklin....	June 2	2 85	216	447 84	192 76	640 60
Baring street, from Thirty-second street west, 195 feet.....	" "	Mar. 30	2 43	241	527 50	83 13	610 63
Beechwood street, from Montgomery to Columbia avenues..	" "	May 25	2 27	550	1,428 00	*	1,320 50
Bolton street, from Twenty-third to Twenty-fourth streets.	" "	Sept. 6	2 68	435	1,084 12	.....	1,084 12
Brooklyn street, from Aspen street north, 318 feet.....	Geo. H. Dutton.....	Nov. 22	2 97	340 ³ / ₁₆	798 34	272 05	1,070 39
Camac street, from Columbia to Montgomery avenues.....	Jos. McDonald.....	April 12	2 35	553	1,405 50	*	1,374 55
Cambria and Rorer streets.....	Geo. H. Miller.....	Nov. 21	2 57	521 9	1,223 76	130 62	1,354 38
Canal street (old Cohocksink creek), main sewer.....	Hugh Deehan.....	Oct. 1	{ 15 00 and 8 00 }	1,652	3,992 20	12,954 80	16,947 00
Carpenter street, from Sixth street to Passyunk avenue.....	Edw. S. McGlue.....	Nov. 27	3 23	460	929 75	659 55	1,589 30
Christian street, from Broad to Fifteenth streets.....	H. C. Eyre.....	Dec. 3	2 71	506	786 75	692 51	1,479 26
Collins street, from Cumberland street north, 306 feet.....	Geo. H. Dutton.....	July 16	2 65	303	418 47	404 48	822 95
Columbia avenue, from Tenth to Eleventh streets.....	Vincent L. McGlue..	May 4	2 14	422	852 25	107 83	960 08
Commerce street, from Adams to Rose streets, thence to Almond street.....	W. B. M. Conklin....	June 14	2 44	560	1,397 80	43 60	1,441 40

Sewers built or completed in 1883—Continued.

SEWERS.	Name of Contractor.	Date.	Price per lin. foot, exclusive of manholes.	Length in feet.	Paid by Assessm't bills.	Paid by the city.	Total cost.
Eighteenth street, from Green street north, 106 feet.....	W. B. M. Conklin....	April 30	\$1 97	135	\$107 00	\$202 92	\$309 92
Eleventh st, from Somerville or Somerset st. to Warnock st.	T. P. Smart.....	April 27	2 47	514	1,169 50	367 08	1,536 58
Fifteenth street, from Columbia to Montgomery avenues....	Francis P. Murray..	Aug. 30	2 43	543	1,410 04	*	1,379 49
Fifth street, from Lehigh avenue to Somerset street.....	Geo. H. Miller.....	Dec. 7	3 25	640	1,401 50	759 50	2,161 00
Fortieth street, from Powelton avenue to Baring street.....	Bernard McNichol..	Nov. 24	2 75	444 ²⁵ / ₁₀₀	1,094 46	167 23	1,261 69
Forty-seventh street, Mill creek, main sewer.....	W. H. H. Achuff....	Oct. 10	44 75	774	1,340 31	33,296 19	34,636 50
Front street, from Coral street north, 499 feet.....	W. B. M. Conklin....	Aug. 9	2 47	490	1,355 14	*	1,282 30
Germanatown ave., from Montgomery ave. south, 378 feet...	Ellwood Measy.....	May 7	2 39	378	963 36	.....	943 42
Hancock street, from Mill street south, 690 feet.....	W. B. M. Conklin....	Sept. 24	2 67	629	1,791 03	1,183 73	2,974 76
Herman street from Twenty-eighth to Dover streets.....	W. H. H. Achuff.....	Dec. 10	3 98	362	905 00	591 76	1,496 76
Huntingdon street, from Coral to Amber streets.....	W. B. M. Conklin....	May 14	2 14	420	682 47	266 33	948 80
Lawrence street, from Cumberland to Huntingdon streets..	Jos. McDonald.....	Sept. 27	2 30	561	1,348 00	*	1,338 30
Lehigh avenue, from Hancock to Mascher streets.....	W. H. H. Achuff.....	Nov. 24	2 79	269	508 75	297 76	806 51
Lehigh avenue, from Waterloo to Mascher streets.....	T. P. Smart.....	Dec. 3	3 23	728 8	1,434 25	994 34	2,428 59
Liberty street, from Myrtle to Pennsylvania Railroad.....	W. H. H. Achuff.....	Nov. 14	2 99	622	1,594 42	349 36	1,943 78
Locust street, from Broad to Fifteenth streets.....	Bernard McNichol...	Dec. 11	2 80	651 ¹ / ₂	1,185 00	740 32	1,925 32

Sewers built or completed in 1883—Continued.

SEWERS.	Name of Contractor.	Date.	Price per lin. foot, exclusive of manholes.	Length in feet.	Paid by Assessment bills.	Paid by the city.	Total cost.
Marlborough street, from Beach to Delaware avenue.....	W. B. M. Conklin....	Nov. 28	\$1 35	242	.....	\$354 70	\$354 70
Marshall street, from Venango to Erie avenue.....	W. H. H. Achuff.....	April 16	3 65	537	\$1,293 67	741 38	2,035 05
Mascher street, from York to Dauphin streets.....	Jos. McDonald.....	June 25	2 38	533	1,379 04	*	1,343 54
Montgomery avenue, from Sixteenth to Seventeenth sts....	M. C. Hong.....	Nov. 22	2 67	463	1,055 02	229 19	1,284 21
Morris street, from Tenth to Eleventh streets.....	T. P. Smart.....	June 19	2 49	420	1,050 25	225 55	1,275 80
Mountain street, from Eighth to Ninth streets.....	W. B. M. Conklin....	June 15	2 33	426 4	1,037 00	2 24	1,039 24
Moyer streets, from Vienna to Montgomery avenue.....	John Mack.....	Nov. 10	3 23	355	877 16	325 49	1,202 65
Nassau street, from Twenty-third to Twenty-fourth streets.	W. B. M. Conklin....	Sept. 6	2 73	444	1,140 72	.....	1,140 72
Nieholas street, from Twenty-fifth to Twenty-sixty streets.	Wm. Armstrong.....	Dec. 1	3 05	436	978 50	501 30	1,479 80
Nineteenth street, from Girard ave. to South College ave....	Francis P. Murray..	Nov. 8	2 85	302	681 30	249 40	930 70
Norris street, from Sixth to Marshall streets.....	" "	Sept. 26	2 54	203	420 62	.....	420 62
Norwood street, from Montgomery to Columbia avenues.....	W. B. M. Conklin....	June 27	2 33	550	1,428 50	*	1,353 50
Ontario street, from Seventeenth to Eighteenth streets.....	Geo. H. Miller.....	July 14	5 52	443	1,022 00	144 36	1,166 36
Ontario street, from Thompson to Master streets.....	" "	Oct. 13	4 00	453	1,169 98	736 00	1,905 98
Orthodox street, from Little Tacony creek to Mulberry st..	W. B. M. Conklin....	Dec. 7	2 86	1,139 6	2,940 20	462 77	3,402 97
Phillip street, from Columbia to Oxford streets.....	" "	Mar. 31	2 19	527	1,383 54	*	1,229 13

Sewers built or completed in 1883—Continued.

SEWERS.	Name of Contractor.	Date.	Price per lin. foot, exclusive of manholes.	Length in feet.	Paid by Assessme't bills.	Paid by the city.	Total cost.
Phillip street, from Norris street south, 325 feet.....	W. H. H. Achuff.....	Dec. 10	\$2 98	323 8	\$914 00	\$106 53	\$1,020 53
Pine street, from Sixth street west.....	Vincent L. McGlue..	July 26	2 44	239 ⁵ / ₁₆	602 39	27 00	629 39
Rockland street, from Thirty-ninth to a point west of } Thirty-eighth street, 105 feet.....	Jos. McDonald.....	Dec. 13	2 85	508	1,393 99	103 81	1,497 80
St. Mary street, from Seventh to Eighth streets, and on } Eighth to South streets.....	Vincent L. McGlue..	July 28	2 69	610 ⁵ / ₁₆	1,337 25	695 00	2,032 25
Second street, from Vine to Wilmer streets.....	Wm. Armstrong.....	Nov. 7	3 29	337	849 06	359 67	1,208 73
Sedgley ave., from Susquehanna to Dauphin streets (main } sewer)	W. H. H. Achuff.....	Jan. 3	{ 17 00 and 19 00 }	820 ¹ / ₂	12,396 30	1,917 20	14,313 50
Seventh street, from Cumberland to York streets.....	Jos. McDonald.....	May 31	2 33	537	1,080 00	246 21	1,326 21
Seventh to Alaska streets, and St. Mary to Lombard streets.	T. P. Smart.....	Dec. 13	3 23	448	836 78	686 38	1,523 66
Sixth, Barclay, and Powell streets.....	Walter D. Stone.....	May 17	4 85	1,303 ³⁸ / ₁₀₀	2,627 36	3,867 50	6,494 96
Sixth street, from Lehigh avenue to Huntingdon streets.....	Jos. McDonald.....	July 27	2 29	518	1,409 90	*	1,261 22
Sixth street, from Venango to Erie avenue.....	John M. Mack.....	Dec. 12	2 87	542 7	1,302 25	338 96	1,641 21
Spring Garden street, from Eighth to Lorain streets.....	Geo. H. Miller.....	May 29	2 63	785	1,435 40	874 15	2,309 55
Tackawanna st., from Orthodox to Cedar sts., on Pear st.....	Wm. Armstrong.....	Dec. 3	2 93	298	604 07	419 07	1,023 14

Sewers built or completed in 1883—Continued.

SEWERS.	Name of Contractor.	Date.	Price per lin. foot, exclusive of manholes.	Length in feet.	Paid by Assessment bills.	Paid by the city.	Total cost.
Tenth street, from Dauphin to York streets.....	M. C. Hong.....	Dec. 1	\$3 73	524	\$1,260 05	\$754 47	\$2,014 52
Third street, from Market to Arch streets.....	Wm. Armstrong.....	July 20	4 99	779 ⁸ / ₁₆	1,831 29	2,234 91	4,066 20
Thirteenth street, from Market to Kelly streets.....	W. B. M. Conklin....	April 23	2 99	418 ⁷ / ₁₆	778 50	548 41	1,326 91
Thirteenth street, from Race to Vine streets.....	Bernard McNichol...	Nov. 17	2 30	474 ⁶ / ₁₆	.....	1,153 04	1,153 04
Thirtieth street, from Susquehanna to Ridge avenues, } and on Ridge avenue to Twenty-ninth street.....	W. B. M. Conklin....	May 21	2 39	1,197	2,426 66	590 34	3,017 00
Thirty-fifth, Eadline, and Haverford streets.....	Jos. McDonald.....	Dec. 7	8 28 ² / ₁₆ and 21 18	2,380 ¹ / ₁₆	5,770 72	*	5,579 78
Thirty-ninth street, from Oregon to Aspen streets.....	Bernard McNichol...	Nov. 22	2 80	402	942 50	233 10	1,175 60
Turner street, from Twenty-fifth to Twenty-sixth streets...	W. B. M. Conklin....	Oct. 13	2 87	440	1,013 45	.....	1,013 45
Twentieth street, from Ontario to Tioga streets.....	" "	Dec. 4	.....	538	1,193 58	140 24	1,333 82
Twenty-eighth street, from Oxford to Columbia avenue.....	Jas. D. Mendenhall.	Dec. 8	3 95	1,379	3,306 51	2,265 54	5,572 05
Twenty-second street, from Chestnut to Sansom streets.....	W. B. M. Conklin....	Mar. 21	2 73	290 ² / ₁₆	627 50	202 75	830 25
Twenty-second street, from Locust to Spruce streets.....	" "	July 17	1 87	444 ⁸ / ₁₆	891 25	12 15	903 40
Twenty-seventh street, from Parrish to Cambridge streets..	Jos. H. Murray.....	July 6	3 85	700	1,537 80	1,462 20	3,000 00
Twenty-seventh st., from Columbia to Montgomery aves ...	M. C. Hong.....	Dec. 1	2 87	642	1,329 96	560 58	1,890 54

Sewers built or completed in 1883—Continued.

SEWERS.	Name of Contractor.	Date.	Price per lin. foot, exclusive of manholes.	Length in feet.	Paid by Assessme't bills.	Paid by the city.	Total cost.
Twenty-seventh st., from Columbia ave. to Oxford street....	Jas. D. Mendenhall.	Dec. 8	\$5 20	509	\$1,153 00	\$1,543 00	\$2,696 80
Van Pelt street, from Berks to Norris streets.....	Vincent L. McGlue..	May 31	2 42	538	1,351 80	110 16	1,461 96
Venango street, from Fifth to Ninth streets, and on } Ninth street south.....	W. B. M. Conklin....	May 2	2 09	1,802 7 $\frac{3}{4}$	3,882 70	84 83	3,967 53
Washington avenue, east from Front street.....	"	May 19	2 33	491	539 71	680 49	1,220 20
Willington street, from Jefferson to Oxford streets.....	Francis P. Murray..	Dec. 8	2 95	508	1,346 27	222 33	1,568 60
Winter street, from Fifteenth to Sixteenth streets.....	Hugh Deehan.....	Dec. 8	5 00	442	1,110 17	1,219 83	2,330 00
				46,558	\$114,918 18	\$82,606 28	196,660 45

* The Surplus was paid into the City Treasury.

33
33

Important information relative to paved streets, macadamized streets, country roads, street repairs, street cleaning, population, real estate valuation, etc.

For the purposes of this table, each ward includes the full width of all streets forming its northern and western boundaries.	Population.	Belgian block pavement.	Asphalt pavement.	Cobble pavement.	Total pavement.		Without Passenger Railroad.		With Passenger Railroad.		Area.		
					Length.	Area.	Length.	Sq. yds.	Miles.	Sq. yds.		Length.	Sq. yds.
Wards.	1880.	Sq. yds.	Sq. yds.	Sq. yds.	Miles.	Sq. yds.	Miles.	Sq. yds.	Miles.	Sq. yds.	Sq. yds.		
First.....	43,085	8,667	.....	340,399	32.10	349,066	23.31	184,184	8.79	164,882			
Second	28,498	8,166	.....	158,792	13.92	166,958	8.32	67,777	5.60	99,181			
Third	18,271	4,600	.....	101,033	7.37	105,633	5.49	74,419	1.88	31,214			
Fourth.....	18,853	4,600	.....	107,515	7.43	112,115	4.59	62,710	2.84	49,405			
Fifth	16,336	106,685	.....	154,949	11.31	261,634	5.17	162,462	6.14	99,172			
Sixth	10,004	55,315	.....	211,467	10.90	266,782	5.07	159,437	5.83	107,345			
Seventh.....	31,087	12,841	.....	306,225	16.62	319,066	9.12	203,848	7.50	115,218			
Eighth	19,545	21,911	184	290,221	15.71	312,316	7.91	188,557	7.80	123,759			
Ninth.....	12,481	52,450	.....	300,691	12.42	353,141	5.35	204,022	7.07	149,119			

Important information relative to paved streets, macadamized roads, etc.—Continued.

Wards.	Dolls.	Cts.	Contract price in each ward, for all pavement repairs needed during 1884.	Dolls.	Dolls.	Rate for 1884 per 100 sq. yds. of streets without Pass. Railways.	Miles.	Length of macadamized roads.	Miles.	Length of unpaved roads.	Contract price in 1883, for main-tenance of macadamized and unpaved roads and bridges not exceeding eight feet span.	Dollars.	Contract price in 1884, for main-tenance of macadamized and unpaved roads and bridges not exceeding eight feet span.	Dollars.	Contract price for street cleaning and removing ashes and dead animals, ten months of 1883.	Dollars.	Contract price for street cleaning and removing ashes and dead animals, twelve months of 1884.	Dollars.	Contract price for removing garb-age, ten months of 1883.	Dolls.	Contract price for removing garb-age, twelve months of 1884.	Dollars.	Total taxable real est. valuation, 1884. Part taxed at full or city rates. " " at 2/3 or suburban rates. " " at 1/2 or farm rates.	Dollars.	Adjusted for comparison to amounts that will at full city rates, yield the same revenue as from the full valuation by the three rates.	Dollars.
First	4,150	74	7,280	3 95	1.43	5.73	2,500	947 50	8,690	7,799	780	585	15,423,458	14,465,285												
Second	1,500	74	2,500	3 68	.....	.....	* .....	* .....	11,798	7,200	999	500	11,037,500	11,037,500												
Third	1,500	74	4,000	5 37	.....	.....	* .....	* .....	17,955	5,569	1,400	543	6,632,550	6,632,550												
Fourth	1,500	74	2,000	3 18	.....	.....	* .....	* .....	21,390	5,567	.....	767	7,615,860	7,615,860												
Fifth	1,150	74	3,700	2 27	.....	.....	* .....	* .....	8,500	8,437	1,850	698	24,772,264	24,772,264												
Sixth	1,250	54	2,500	1 57	.....	.....	* .....	* .....	8,500	9,000	700	697	37,320,413	37,320,413												
Seventh	1,250	54	2,444	1 19	.23	.....	* .....	* .....	23,440	6,223	.....	474	19,808,550	19,808,550												
Eighth	1,250	54½	2,999	1 59	.25	.....	* .....	* .....	.....	7,444	1,200	400	42,234,800	42,234,800												
Ninth	1,150	52½	2,444	1 19	.24	.....	* .....	* .....	.....	8,443	.....	423	35,602,219	35,602,219												

Important information relative to paved streets, macadamized roads, etc.—Continued.

For the purposes of this table, each ward includes the full width of all streets forming its northern and western boundaries.	Population.	Belgian block pavement. Sq. yds.	Asphalt pavement. Sq. yds.	Cobble pavement. Sq. yds.	Total pavement.		Without Passenger Railroad.		With Passenger Railroad.		Street pavements are divided between railroad and non-railroad streets, as follows:
					Length.	Area. Sq. yds.	Length. Miles.	Area. Sq. yds.	Length. Miles.	Area. Sq. yds.	
Wards.	1880.	Sq. yds.	Sq. yds.	Sq. yds.	Miles.	Sq. yds.	Miles.	Sq. yds.	Miles.	Sq. yds.	
Tenth.....	23,363	10,335	.....	253,235	14.15	263,570	7.79	165,415	6.36	98,155	
Eleventh.....	12,930	15,781	.....	145,574	7.30	161,355	4.31	106,473	2.99	54,882	
Twelfth.....	14,690	2,038	.....	162,354	6.92	164,392	4.00	106,570	2.92	57,822	
Thirteenth.....	18,646	.....	.....	224,752	11.32	224,752	7.12	152,478	4.20	72,274	
Fourteenth.....	22,354	34,193	.....	254,905	12.38	289,098	7.38	194,290	5.00	94,808	
Fifteenth.....	47,865	18,756	7,494	725,857	32.33	752,107	18.34	507,938	13.99	244,169	
Sixteenth.....	17,802	7,366	.....	142,375	8.76	149,741	6.12	99,516	2.64	50,225	
Seventeenth.....	20,451	.....	.....	129,517	8.65	129,517	4.70	64,133	3.95	65,384	
Eighteenth.....	29,354	720	.....	287,989	18.58	288,709	13.64	202,286	4.94	86,423	

Important information relative to paved streets, macadamized roads, etc.—Continued.

Wards.	Appropriation in 1883 for repairs to pavements, by square yards.	Price per square yard paid for repairs in 1883.	Contract price in each ward, for all pavement repairs needed during 1884.	Rate for 1884 per 100 sq. yds. of streets without Pass. Railways.	Length of macadamized roads.	Length of unpaved roads.	Contract price in 1883, for maintenance of macadamized and unpaved roads and bridges not exceeding eight feet span.	Contract price in 1884, for maintenance of macadamized and unpaved roads and bridges not exceeding eight feet span.	Contract price for street cleaning and removing ashes and dead animals, ten months of 1883.	Contract price for street cleaning and removing ashes and dead animals, twelve months of 1884.	Contract price for removing garbage, ten months of 1883.	Contract price for removing garbage, twelve months of 1884.	Total taxable real est. valuation, 1884. Part taxed at full or city rates. " " at 1/3 or suburban rates. " " at 1/3 or farm rates.	Real estate valuation. Adjusted for comparison to amounts that will, at full city rates, yield the same revenue as from the full valuation by the three rates.
	Dolls.	Cts.	Dolls.	Dolls.	Miles.	Miles.	Dollars.	Dollars.	Dollars.	Dolls.	Dollars.	Dolls.	Dollars.	Dollars.
Tenth	1,150	49	2,900	1 75	.24	.....	* .....	* .....	12,000	7,333	900	600	21,375,888	21,375,888
Eleventh	2,150	50	3,000	2 81	.....	.....	* .....	* .....	25,000	4,700	2,974	791	9,005,525	9,005,525
Twelfth	1,200	50	2,500	2 34	.....	.....	* .....	* .....	.....	6,970	.....	787	8,513,850	8,513,850
Thirteenth	1,200	50	2,900	1 90	.....	.....	* .....	* .....	13,970	7,244	3,239	893	13,148,450	13,148,450
Fourteenth	1,150	39	3,100	1 59	.....	.....	* .....	* .....	.....	7,443	.....	990	13,904,100	13,904,100
Fifteenth	3,700	34	6,000	1 18	.47	.....	* .....	* .....	14,444	13,333	1,444	2,330	32,198,690	32,198,690
Sixteenth	2,500	35	3,000	3 01	.....	.....	* .....	* .....	11,470	5,950	749	449	7,753,100	7,753,100
Seventeenth	2,500	35	2,900	4 52	.....	.....	* .....	* .....	.....	5,500	.....	449	6,966,350	6,966,350
Eighteenth	3,700	34	5,945	2 93	.....	.....	* .....	* .....	12,220	8,100	774	600	10,654,500	10,654,500

Important information relative to paved streets, macadamized roads, etc.—Continued.

For the purposes of this table, each ward includes the full width of all streets forming its northern and western boundaries.	Population.	Belgian block pavement.	Asphalt pavement.	Cobble pavement.	Total pavement.		Street pavements are divided between railroad and non-railroad streets, as follows:			
					Length.	Area.	Without Passenger Railroad.		With Passenger Railroad.	
Wards.	1880.	Sq. yds.	Sq. yds.	Sq. yds.	Miles.	Sq. yds.	Length.	Area.	Length.	Area.
Nineteenth	43,887	2,715	.....	457,948	31.18	460,663	20.41	247,829	10.77	212,834
Twentieth	43,207	32,940	4,961	323,363	24.21	361,264	14.32	197,453	9.89	163,811
Twenty-first	19,699	2,426	.....	73,406	7.42	75,832	2.76	42,588	4.66	33,244
Twenty-second	31,798	67,249	.....	7,255	3.82	74,504	.95	13,704	2.87	60,800
Twenty-third	26,522	.....	.....	201,377	13.38	201,377	12.57	189,033	.81	12,344
Twenty-fourth	46,057	124,049	936	867,259	50.15	992,244	29.55	595,343	20.60	396,901
Twenty-fifth	36,104	4,166	829	504,840	43.02	509,835	33.37	303,510	9.65	206,325
Twenty-sixth	35,138	14,800	.....	239,356	21.38	254,156	14.02	114,123	7.36	140,033
Twenty-seventh	23,284	13,120	.....	520,343	22.19	533,463	16.38	373,286	5.81	160,177

Important information relative to paved streets, macadamized roads, etc.—Continued.

Wards.	Dolls.	Cts.	Contract price in each ward, for all pavement repairs needed during 1884.	Rate for 1884 per 100 sq. yds. of streets without Pass. Railways.	Miles.	Length of macadamized roads.	Miles.	Length of unpaved roads.	Contract price in 1883, for main-tenance of macadamized and unpaved roads and bridges not exceeding eight feet span.	Dollars.	Contract price for street cleaning and removing ashes and dead animals, ten months of 1883.	Dolls.	Contract price for street cleaning and removing ashes and dead animals, twelve months of 1884.	Contract price for removing garbage, ten months of 1883.	Dollars.	Contract price for removing garbage, twelve months of 1884.	Total taxable real est. valuation, 1884. Part taxed at full or city rates. " " at $\frac{2}{3}$ or suburban rates. " " at $\frac{1}{2}$ or farm rates.	Dollars.	Adjusted for comparison to am'ts that will, at full city rates, yield the same revenue as from the full valuation by the three rates.
Nineteenth	4,550	34	15,600	6 29	.....	.....	.....	* .....	10,850	9,200	790	650	18,686,625	790	18,686,625	650	18,686,625	18,686,625	18,686,625
Twentieth.....	2,800	34	9,100	4 60	.....	.....	.....	* .....	15,900	14,600	700	943	26,813,250	700	26,813,250	943	26,813,250	26,813,250	26,813,250
Twenty-first	650	53	495	1 16	3.25	41.	.....	2,444 00	3,770	2,950	490	399	6,699,104	490	6,699,104	399	6,699,104	6,699,104	3,791,930
Twenty-second....	450	53	495	3 61	23.	160.	.....	5,090 00	4,700	3,600	1,000	2,250	18,877,684	1,000	18,877,684	2,250	18,877,684	10,468,425	10,468,425
Twenty-third.....	2,450	54	5,450	2 88	6.	115.	.....	6,050 00	3,474	2,775	399	423	9,898,547	399	9,898,547	423	9,898,547	4,810,825	4,810,825
Twenty-fourth ...	3,300	45	6,900	1 15	.62	34.75	.....	2,250 00	9,500	9,800	1,800	988	26,759,851	1,800	26,759,851	988	26,759,851	22,640,260	22,640,260
Twenty-fifth	3,100	53	11,000	3 62	2.	30.	.....	2,400 00	6,000	4,595	599	450	14,200,705	599	14,200,705	450	14,200,705	9,920,026	9,920,026
Twenty-sixth.....	2,800	68	4,900	4 29	2.19	8.79	.....	947 50	9,500	8,704	500	500	14,459,891	500	14,459,891	500	14,459,891	12,561,750	12,561,750
Twenty-seventh..	2,850	51	3,900	1 04	1.12	26.25	.....	1,300 00	9,500	5,900	939	1,500	18,407,346	939	18,407,346	1,500	18,407,346	15,278,345	15,278,345

Important information relative to paved streets, macadamized roads, etc.—Continued.

For the purposes of this table, each ward includes the full width of all streets forming its northern and western boundaries.	Population.	Belgian block pavement.	Asphalt pavement.	Cobble pavement.	Total pavement.		Without Passenger Railroad.		With Passenger Railroad.	
					Length.	Area.	Length.	Area.	Length.	Area.
Wards.	1880.	Sq. yds.	Sq. yds.	Sq. yds.	Miles.	Sq. yds.	Miles.	Sq. yds.	Miles.	Sq. yds.
Twenty-eighth.....	34,442	4,720	9,550	597,580	37.56	611,850	26.82	392,854	10.74	218,996
Twenty-ninth.....	40,787	23,539	1,442	427,175	31.85	452,156	21.03	260,864	10.82	191,292
Thirtieth.....	29,100	.....	.....	245,713	16.51	245,713	11.19	192,067	5.32	53,646
Thirty-first.....	31,308	.....	.....	350,460	22.70	350,460	18.70	280,357	4.00	70,103
Totals.....	846,948	654,148	25,396	9,113,925	573.54	9,793,469	369.80	6,109,526	203.74	3,683,943

Important information relative to paved streets, macadamized roads, etc.—Continued.

Wards.	Appropriation in 1883 for repairs to pavements, by square yards.	Price per square yard paid for re-	Contract price in each ward, for all pavement repairs needed during 1884.	Rate for 1884 per 100 sq. yds. of streets without Pass. Railways.	Length of macadamized roads.	Miles.	Length of unpaved roads.	Contract price in 1883, for main-tenance of macadamized and unpaved roads and bridges not exceeding eight feet span.	Contract price for street cleaning and removing ashes and dead animals, ten months of 1883.	Contract price for street cleaning and removing ashes and dead animals, twelve months of 1884.	Contract price for removing garbage, ten months of 1883.	Contract price for removing garbage, twelve months of 1884.	Total taxable real est. valuation, 1884.	Part taxed at full or city rates. " " at $\frac{2}{3}$ or suburban rates. " " at $\frac{1}{2}$ or farm rates.	Adjusted for comparison to amounts that will, at full city rates, yield the same revenue as from the full valuation by the three rates.
	Dolls.	Cts.	Dolls.	Dolls.	Dolls.	Miles.	Miles.	Dollars.	Dollars.	Dolls.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
Twenty-eighth ...	2,950	30	9,000	2 29	3.24	21.17	*	*	7,250	9,150	495	815	22,573,688	18,468,125	
Twenty-ninth	3,400	30	11,000	4 21	.....	.....	* .....	* .....	9,900	10,800	1,500	1,095	27,689,450	27,449,150	
Thirtieth.....	2,450	70	4,500	2 34	.....	.....	* .....	* .....	8,400	5,975	799	475	11,635,690	11,635,690	
Thirty-first	3,650	34	5,500	1 96	.....	.....	* .....	* .....	11,340	8,500	1,150	698	10,709,405	10,709,405	
Totals.....	69,350	.....	149,952	.....	44.28	442.69	34,785	23,924 00	290,961	228,804	28,170	24,165	551,379,303	516,243,700	

* Paid for maintenance of unpaved streets and roads in 2d, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 28th, 29th, 30th, and 31st Wards, contract price in 1883, \$3,300; and in 1884, \$2,495.

Total Lengths and Areas of Streets.

Total length of paved passenger railway streets.....	203.74 miles
Total length of paved streets without passenger railways.	369.80 “
Total length of all paved streets (exclusive of macadam- ized streets).....	573.54 “
Total length of macadamized streets.....	44.28 “
Total length of unpaved streets and roads.....	*442.69 “
Total length of streets of all kinds.....	1,060.51 “
Area of paved passenger railway streets.....	3,683,943 sq. yds
Area of paved streets without passenger railways.....	6,109,526 “ “

* Some squares of graded but unpaved streets have probably been missed in making the above tables, though the percentage of error is quite small.

APPENDIX.

Amount of Travel in one hour on various Streets in the City of Philadelphia, East and West.

Observations were made by the Police Force in 1884, from 9 to 10 A. M., and 3 to 4 P. M.
Record below gives the average amount of travel per hour as obtained from observations as above.

	One-horse Business Wagons.	Two-horse Business Wagons.	Three or more horse Business Wagons.	Carts.	Drays, Omnibuses, and Catamarans.	One-horse Pleasure Carriages.	Two or more horse Pleasure Carriages.	Horse Cars.	Loose Animals.	Pedestrians.
Girard avenue, at Frankford avenue....A	97	54	1	23	.....	9	2	34	.....	189
Girard avenue, at Thirtieth street.....B	83	41	3	160	.....	10	17	49	.....	276
Poplar street, at Front street.....C	40	17	.....	15	.....	7	.....	.....	.....	352
Poplar street, at Eighteenth street.....D	18	5	.....	6	.....	1	2	9	2	80
Green street, at Eighth street.....E	53	31	2	9	1	4	3	18	.....	745
Green street, at Twenty-fifth street.....F	17	3	.....	10	.....	32	16	8	6	87
Vine street, at Second street.....G	77	52	1	4	1	6	4	.....	.....	.....
Vine street, at Sixteenth street.....H	89	23	2	11	7	11	1	15	40	141
Arch street, at Fourth street.....I	112	63	1	13	1	8	3	63	.....	.....
Arch street, at Sixteenth street.....J	49	33	.....	22	.....	15	15	35	1	211
Market street, at Twenty-second street..K	161	99	6	65	3	35	17	81	16	297
Market street, at Seventh street.....L	357	132	2	24	21	39	3	106	.....	2065
Market street, at Thirty-second street..M	378	225	18	155	11	56	29	121	17	240
Chestnut street, at Fifth street.....N	103	34	1	3	4	17	2	39	.....	3300
Chestnut street, at Twentieth street.....O	43	19	.....	11	1	16	4	35	1	68
Dock street, at Front street.....P	201	159	.....	.....	28	7	.....	.....	.....	.....
Walnut street, at Second street.....Q	79	30	.....	3	9	8	.....	51	30	.....
Walnut street, at Fifth street.....R	72	3	2	11	.....	35	4	46	.....	185
Spruce street, at Fifth street.....S	31	29	.....	5	1	9	.....	14	.....	.....
Spruce street, at Sixteenth street.....T	26	18	.....	17	.....	13	15	12	.....	166
South street, at Second street.....U	54	29	1	18	5	.....	.....	18	.....	141
South street, at Twenty-first street.....V	44	22	.....	15	1	2	1	13	.....	514

Amount of Travel in one hour on various Streets in the City of Philadelphia, North and South.

Observations were made by the Police Force in 1884, from 9 to 10 A. M., and 3 to 4 P. M.
Record below gives the average amount of travel per hour as obtained from observations as above.

	One-horse Business Wagons.	Two-horse Business Wagons.	Three or more horse Business Wagons.	Carts.	Drays, Omnibuses, and Catamarans.	One-horse Pleasure Carriages.	Two or more horse Pleasure Carriages.	Horse Cars.	Loose Animals.	Pedestrians.
Delaware avenue, at Noble street.....a	80	97	1	26	2	2	.....	.....	.....	383
Front street, at Columbia avenue.....b	89	32	1	17	1	5	3	28	1	81
Front street, at Spruce street.....c	78	54	1	4	1	3	.....	27	.....	.....
Third street, at Vine street.....d	150	88	1	13	2	6	1	54	.....	635
Third street, at South street.....e	57	35	1	20	1	5	1	16	3	.....
Fifth street, at Girard avenue.....f	89	46	1	7	1	8	1	29	.....	383
Fifth street, at Spruce street.....g	24	28	.....	12	9	6	.....	32	.....	.....
Passyunk avenue, at Seventh street.....h	19	8	.....	10	1	4	.....	13	2	388
Eighth street, at Green street.....i	61	25	.....	5	1	3	2	33	.....	817
Eighth street, at Walnut street.....j	76	22	.....	9	2	9	4	31	.....	1633
Ninth street, at South street.....k	48	20	1	11	1	5	.....	23	.....	303
Ninth street, at Callowhill street.....l	56	16	.....	3	1	2	.....	48	.....	353
Eleventh street, at Christian street.....m	36	11	.....	6	2	1	.....	17	.....	109
Eleventh street, at Columbia avenue....n	43	15	.....	23	1	5	2	35	.....	.....
Passyunk avenue, at Thirteenth street..o	17	4	.....	5	.....	2	1	11	.....	328
Broad street, at Vine street.....p	143	174	.....	33	3	138	40	.....	.....	344
Broad street, at Washington avenue.....q	94	57	1	18	2	26	13	26	4	1146
Fifteenth street, at Fairmount avenue..r	26	12	.....	5	1	6	3	30	.....	80
Fifteenth street, at Market street.....s	56	22	.....	8	.....	7	5	26	1	495
Twenty-second street, at Callowhill st...t	51	33	.....	28	3	54	27	19	1	103
Twenty-second street, at Spruce street..u	69	34	.....	72	3	26	11	20	.....	222
Thirtieth street, at Chestnut street.....v	126	75	.....	108	15	16	11	86	3	246
Thirty-eighth street, at Lancaster av...w	65	16	.....	42	3	11	3	37	1	193

1883.

PROPOSALS

FOR REPAIRING SEWERS, INLETS AND INLET-NECKS, AND
CLEANING SEWERS AND INLET-NECKS.

To the Chief Commissioner of Highways.

SIR:—The undersigned offer the following proposals to repair all sewers, inlets and inlet-necks, and clean all sewers and inlet-necks during the year 1883, in the following districts, and in strict accordance with the annexed specifications, for the sums named below:

First Sewer Repair District (from the Delaware to the Schuylkill rivers, and south of and including Market street), Alex. Armstrong, 1418 Christian street.....	\$3,500
Second Sewer Repair District (from the Delaware to Schuylkill rivers, and north of Market street), Alex. Armstrong, 1418 Christian street.....	4,890
Third Sewer Repair District (west of the Schuylkill river, Twenty-fourth and Twenty-seventh Wards), W. H. H. Achuff, 4327 Aspen street.....	1,489

NOTE.—Parties offering proposals must fill out their bids both in writing and in figures, and must give their names and address in full. Bids will be received for any or all the districts; but two or more districts must not be grouped under one price. A bond in the sum of \$500 for each district bid for must be filed with the City Solicitor, and certificate of the same must accompany each proposal. The right to reject any or all bids is reserved.

1883. SPECIFICATIONS

FOR REPAIRING SEWERS, INLETS AND INLET-NECKS, AND
CLEANING SEWERS AND INLET-NECKS.

All sewers not exceeding four (4) feet in their least diameter are to be put in good repair, and maintained in good repair, throughout the balance of the year 1883.

All inlets, man-holes and well-holes are to be put in good repair, and maintained in good repair, throughout the balance of the year 1883, whether such repairs involve retrapping, rebuilding in part or whole, furnishing new material, or other work.

All inlet-necks are to be put in good repair, and maintained in good repair, throughout the balance of the year 1883.

All obstructed inlet-necks and all obstructed sewers, whose least diameter does not exceed four (4) feet, shall be promptly cleaned and put in good repair upon order from the Highway Department.

All work and material shall be satisfactory to the Highway Department, and not in any way inferior to that required in the construction of new sewers, inlets and inlet-necks.

Notice from the Highway Department to do any work, or supply any material, shall receive attention within forty-eight hours of service of notice.

The contractor must name some office where notices can be served, and where they will receive careful and prompt attention.

Failure at any time to fully and faithfully observe these specifications, and to employ competent and sufficient force for the prompt completion of the work, satisfactory to the Highway Department, shall authorize the Chief Commissioner of Highways to annul the contract, or, at his option, to procure material and tools, and do the work at the expense of the contractor.

Payments will be made one-half in September, and the balance at the expiration of the contract.

Security in the sum of \$500, cash deposit, in addition to that fixed by ordinance, will be required.

1883.

PROPOSALS

FOR FURNISHING AND DELIVERING CROSSING, TRAMWAY
AND GUTTER STONE.*To the Chief Commissioner of Highways.*

SIR:—The undersigned offer the following proposals for furnishing and delivering crossing, tramway and gutter stone, in accordance with the annexed specifications, for the prices named below :

24 inch crossing stone, with square ends and edges (Belgium Bridge), to be twenty-four (24) inches in width, at no point less than five (5) inches in depth or thickness, and not less than four (4) feet in length. Patrick McNichol, 1312 Race street. 72½ cents per linear foot.....	\$4,000
20 inch crossing stone, with square ends and edges (Belgium Bridge), to be twenty (20) inches in width, at no point less than five (5) inches in depth or thickness, and not less than four (4) feet in length. Patrick McNichol. 71 cents per linear foot. About \$4,500 worth.	
Tramway stone, to be sixteen (16) inches in width, at no point less than six (6) inches in depth or thickness, and not less than four (4) feet in length. Dennis Mahoney. 70 cents per linear foot. About \$6,000 worth.....	10,500
16 inch crossing stone, to be sixteen (16) inches in width, at no point less than five (5) inches in depth or thickness, and not less than four (4) feet in length. Wm. B. Murray, 2405 Thompson street. 43 cents per linear foot.....	2,000
Gutter stone, to be ten (10) inches in width, at no point less than five (5) inches in depth or thickness, and not less than four (4) feet in length. Patrick McNichol. 27 cents per linear foot...	3,000

NOTE.—Parties offering proposals must fill out their bids in writing and in figures, and must give their names and address in full. A bond in the sum of \$500 for each item bid for must be filed with the City Solicitor, and certificates of the same must accompany each proposal. The right to reject any and all bids is reserved.

1883.

SPECIFICATIONS

FOR CROSSING, TRAMWAY AND GUTTER STONE.

All stone shall be sound, hard and durable, with smooth top surface, and not inferior in quality to the best "North River" or "Upper Delaware" flagging. They shall have all edges and ends cut straight and rectangular, to lay to joints at no point exceeding one-half ($\frac{1}{2}$) inch in thickness.

Crossing stone, with square-cut ends and edges (Belgium Bridge), shall have ends and edges cut throughout their depths, to lay to joints not exceeding one-half ($\frac{1}{2}$) inch in thickness.

All stone shall be satisfactory to the Commissioner, and shall be delivered in quantities as ordered by the Department of Highways, and at exact points within the city limits as so ordered, promptly, within twenty-four (24) hours of service of notice.

Cash to the amount of ten (10) per cent. of the contract, deposited with the City Treasurer, in addition to real estate security, satisfactory to the City Solicitor, will be required. *Payments* will be made monthly for stone delivered. *Failure* at any time to supply material as ordered shall authorize the Chief Commissioner of Highways to annul the contract, or, at his option, to procure stone elsewhere at the expense of the contractor.

PROPOSALS

FOR REPAIRING PAVED STREETS.

To the Chief Commissioner of Highways.

SIR:—The undersigned offer the following proposals to repair all paved streets during the year 1883, and in strict accordance with the annexed specifications for the sums named below :

Total am't of contract not to ex- ceed	Wards.	CONTRACTORS.	Paving, Per sq. yd.	Cutting stone, per lin. foot.	
				Gutter.	Cross'g.
\$4,150	1st	V. L. McGluc, 601 Girard avenue.....	.74	.12	.12
1,500	2d	" " " "	.74	.12	.12
1,500	3d	" " " "	.74	.12	.12
1,500	4th	" " " "	.74	.12	.12
1,150	5th	" " " "	.74	.12	.12
1,250	6th	Samuel A. Miller, 717 E. Dauphin street.	.54	.20	.20
1,250	7th	" " " "	.54	.20	.20
1,250	8th	Sam'l Kilpatrick, 822 N. Nineteenth st.	.54 $\frac{1}{2}$	.11	.11
1,150	9th	" " " "	.52 $\frac{1}{2}$	.11	.11
1,150	10th	John P. Kennedy, 1514 Centennial ave..	.49	.03	.03
2,150	11th	Joseph Johnson, 2122 Hancock street ...	.50	.05	.05
1,200	12th	" " " "	.50	.05	.05
1,200	13th	" " " "	.50	.05	.05
1,150	14th	R. Walter Peterson, 2225 Wallace street.	.39	.05	.13
3,700	15th	" " " "	.34	.05	.13
2,500	16th	Joseph Johnson, 2122 Hancock street...	.35	.05	.05
2,500	17th	" " " "	.35	.05	.05
3,700	18th	" " " "	.34	.05	.05
4,550	19th	" " " "	.34	.05	.05
2,800	20th	" " " "	.34	.05	.05
650	21st	Wm. B. M. Conklin, 1417 Marlborough st.	.53	.14	.14
450	22d	" " " "	.53	.14	.14
2,450	23d	Samuel A. Miller, 717 E. Dauphin street.	.54	.20	.20
3,300	24th	R. Walter Peterson, 2225 Wallace street.	.45	.05	.13
3,100	25th	Samuel A. Miller, 717 E. Dauphin street.	.53	.20	.20
2,800	26th	Arthur McGinn, 1228 Thurlow street....	.68	.15	.15
2,850	27th	John P. Kennedy, 1514 Centennial ave..	.51	.03	.03
2,950	28th	Joseph Johnson, 2122 Hancock street...	.30	.05	.05
3,400	29th	" " " "	.30	.05	.05
2,450	30th	Arthur McGinn, 1228 Thurlow street....	.70	.15	.15
3,650	31st	Joseph Johnson, 2122 Hancock street....	.34	.05	.05

To cut and dress the ends of old and new gutter-stone, tramway-stone and crosswalk-stone in the wards bid for
() cents per linear foot of ends so cut and dressed.

NOTE.—Parties offering proposals, must fill out their bids both in writing and in figures, and must give their names and address in full. Bids will be received for any or all the wards, but two or more wards must not be grouped under one price. A bond in the sum of five hundred (500) dollars for each ward bid for, must be filed with the City Solicitor, and certificates of the same must accompany each proposal. Bids for doing the whole work for each ward for a gross sum, under specifications differing from the annexed, will be received on another form of proposal. The right to reject any or all bids is reserved.

Each party bidding must put in price in last item, for cutting stone.

1883.

SPECIFICATIONS

FOR REPAIRS TO PAVED STREETS.

All paving and repairing shall be done in a manner and with material satisfactory to the Chief Commissioner of Highways, or his authorized agent.

The stone shall be well formed, of good and durable quality, and fully up to the standard fixed by Ordinance of January 12, 1868. Defective stone shall be culled out and removed by the contractor to the city yard, or to such point or points as the Chief Commissioner may direct, and all deficiencies in quality or quantity of paving stones of every kind shall be made good by and at the expense of the contractor.

For all paving or repairing there shall be a depth from the top of finished pavement of not less than sixteen inches of good gravel or sharp sand, to be in each case loosened-up and examined before the pavement is put down, and all deficiencies in quantity or quality shall be made good by the contractor. Ashes and cinders shall in no case be used for paving. The paving stones shall be set upright in close contact, and so arranged as to break joints, and give as full and complete as possible a top surface of stone of the requisite depth, and that will be, when rammed, true to the grade and cross section of the street. The pavement shall then be thoroughly rammed with 55-pound rammers, and not less than three times, or till it refuses to yield further. Finally it shall be covered with sharp gravel or coarse sharp sand, free from loam and stones, and barely sufficient to fill the interstices. The street then shall be at once cleaned of all dirt and surplus and refuse material.

The contractor shall employ skilled and experienced men, satisfactory to the Chief Commissioner of Highways, and shall daily give personal supervision to the work, and shall not sublet the same.

Parties on the list of the Highway Department as having defaulted in any contract with the city shall not be interested in the contract or be employed on the work.

All notices from the Highway Department to repair shall receive attention within forty-eight hours, and the contractor shall at all times employ sufficient force to secure such prompt execution of the work.

Failure at any time to promptly, fully and faithfully execute the work shall authorize the Chief Commissioner of Highways to declare the contract forfeited, or, at his option, to purchase material and tools, and employ other parties to do the work, and deduct the cost thereof from the amount set apart for the contract.

The amount of repaving to be done in any square shall be limited by orders from the Highway Department, given in advance of the work, and payments for such repaving shall be at prices per square yard named in the contract, and for measurements made after the pavement is laid, and not to exceed the limits named in said previous orders.

Proposals offered for work herein specified shall give prices per square yard for separate wards, and not for two or more wards grouped under one price.

The price named per square yard shall be the same throughout the ward, for repairing cobble pavement, rubble pavement, Belgian pavement, improved pavement, and setting or resetting gutter-stone, tramway-stone, and crosswalk-stones.

New flag-stones needed for gutters, tramways or crosswalks, will be furnished and delivered within one square of the work by the city. The contractor shall set the same and cut and dress the ends of old or new stones where required. The ends shall be cut and dressed square to the full depth of the stones, and to joints not exceeding three-eighths of an inch in thickness. The price paid for cutting and dressing the stone as above shall be that named in the contract, and shall be so much per linear foot of ends of stone so cut and dressed.

Where repairing of pavement or crosswalks is required for the full width of every street from curb to curb, the right of the city to advertise and contract with other parties therefor is reserved.

A separate proposal bond in the sum of \$500 shall be filed with the City Solicitor for each bid and for each ward.

For the purpose of these specifications, it shall be understood that each ward shall include the full width of all streets forming its northern and western boundaries, and provided, that thereby every street shall be included in some ward, and that the Chief Commissioner of Highways shall determine to which ward the ward boundary street shall belong.

A cash deposit of ten per cent., and real estate security for fifty per cent. of the contract, the amount of which for each ward is to be estimated approximately by the Chief Commissioner of Highways, will be required and must be furnished, and work must be commenced within five days of the award of contract.

Payments will be made on estimates by the Highway Department in July and October, and upon expiration of the contract: *Provided*, That all work previously ordered has been fully and faithfully executed on those dates.

~~Any~~ Any paving or repaving done by the contractor, that at a subsequent date within the year requires, in the judgment of the Chief Chief Commissioner of Highways, repaving again shall be at once put in good order by the contractor without charge

1883.

PROPOSALS

FOR REPAIRING UNPAVED STREETS AND ROADS, MACADAMIZED STREETS AND ROADS, AND SMALL BRIDGES AND DRAINS.

To the Chief Commissioner of Highways.

SIR:—The undersigned offer the following proposals to repair all streets and roads, macadamized streets and roads, and small bridges and drains, during the year 1883, and in strict accordance with the annexed specifications, for the sums named below:

First Ward, Thos. P. Mack, 1821 South Fifth street.....	\$2,500
Twenty-sixth Ward, Joseph S. Weaver, Twenty-sixth and Passyunk avenue.....	825
Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth, Ninth, Tenth, Eleventh, Twelfth Thirteenth, Fourteenth, Fifteenth, Sixteenth, Seventeenth, Eighteenth, Nineteenth, Twentieth, Twenty-eighth, Twenty-ninth, Thirtieth and Thirty-first Wards, W. B. M. Conklin, 1417 Marlborough street.....	3,300
Twenty-first Ward, Jno. Kellerman, 1536 North Tenth street.....	3,000
Twenty-second Ward, A. T. Pooley, 49 Rittenhouse street.....	7,000
Twenty-third Ward (north of Township Line road), W. B. M. Conklin.....	4,680
Twenty-third Ward (south of and including Township Line road), W. B. M. Conklin.....	4,490
Twenty-fifth Ward, John Coon, 2224 Fairhill street.....	3,450
Twenty-fourth Ward, W. H. H. Achuff, 4327 Aspen street.....	3,900
Twenty-seventh Ward, Wm. McGee, Seventy-second and Gray's avenue.....	1,650

NOTE.—Parties offering proposals must fill out their bids both in writing and in figures, and must give their names and address in full. Bids will be received for any or all the items; but two or more items must not be grouped under one price. A bond in the sum of \$500 for each item bid for must be filed with the City Solicitor, and certificates of the same must accompany each proposal. The right to reject any or all bids is reserved.

1883.

SPECIFICATIONS

FOR REPAIRS TO UNPAVED STREETS AND ROADS, MACADAMIZED STREETS AND ROADS, AND SMALL BRIDGES AND DRAINS.

All the unpaved streets and roads within the districts named, and including such portions of the boundary avenues of the city as may come within the district, are to be put in good order, and kept in good order, during the year 1883, by cleaning gutters, and water-courses, filling ruts, washouts, and inequalities, raising the centre of the street or road, to give sufficient crown to ensure the ready and quick removal of all surface waters from the cartway, and removing from the finished surface all loose stones. The best material in the sides of the roads, or material not inferior thereto, shall be used for repairs. Neither sods nor soft mud shall be used to fill inequalities.

Roads that have previously been surfaced with gravel shall be rounded and repaired by scraping the old gravel toward the centre, and making the central 20 feet in width of the roadway of the partially-worn gravel, and adding more gravel thereto, for patches, where the old gravel will not cover.

Side roadways, between the 20 feet above named and the gutters, are to be repaired with the best material in the vicinity, or material not inferior thereto, and the whole made so as to give a regular camber or cross-section that will ensure prompt surface drainage.

All macadamized streets and roads within the district named (except only those on which toll is now collected) shall be repaired by mending all breaks made for house connections or other purposes, filling all ruts and holes, opening all gutters and water-courses, making the side dirt roads to such grade and form as to give the whole street or road from centre to gutters an unbroken and continuous camber that will ensure prompt surface drainage, and admit throughout of ready and safe use for general traffic.

Repairs to macadam shall be made with durable stone or slag, broken to not exceed 3 inches in largest diameter, filled in, compacted, and covered with stone dust, gravel, sand, or ashes.

It is understood that repairs to macadamized streets and roads, as above specified, shall not require the general surface of said macadamized streets to be picked up and an entire new surface supplied, but that all ruts, mud holes, and breaks for house connection, shall be repaired.

The city reserves the right to contract with any party to grade, pave, macadamize, or gravel the surface of any street or road, or to put on stone, gravel, or ashes, at any point or points in streets or roads comprehended in these specifications, and without limiting the liability under these specifications of keeping said places, or other places, in repair.

All public drains in the highways, whether of wood, stone, brick, or other material, that cannot properly be denominated sewers, or sewer connections, shall be put in good repair, and kept in good repair, during the year 1883.

All public bridges in the highways, not exceeding 8 feet span, whether of wood, stone, brick, or other material, shall be put in good repair, and kept in good repair, throughout the year 1883.

All planking put in the cartway of bridges shall be good, sound, merchantable yellow pine or oak plank, 3 inches in thickness, and free from loose knots, shakes, and sap. Repairs shall be made in advance of danger of any part of the structure breaking or wearing out. New plank, in contact with old and thinner plank, shall have their edges trimmed to ease inequalities of thickness.

All material and work shall be satisfactory to the Commissioner, who, in case of dispute, shall determine when, where, and what new material is required. It is understood that entire new structures, at points where similar structures have not heretofore existed, shall not be required under these specifications.

Work shall commence within five days from award of contract, and be prosecuted continuously, whenever the weather will admit, till all streets, roads, and structures are in repair, care being exercised to not unnecessarily disturb the surface of dirt roads during wet weather. All streets, roads, and structures must be in good repair within sixty days from award of contract, and must thereafter be kept in good repair throughout the year 1883.

Notice from the Highway Department to make any repairs must receive attention within forty-eight hours. Failure at any time to fully and faithfully supply the material and do the work in accordance with these specifications, shall authorize the Chief Commissioner of Highways to annul the contract, or, at his option, to supply material, and cause other parties to do the work at the expense of the contractor.

Payments shall be made one-half in July, and the balance upon the expiration of the contract.

For the purpose of these specifications, it shall be understood that each ward shall include the full width of all streets forming its northern and western boundaries, and, provided, that thereby every street shall be included in some ward, and that the Chief Commissioner of Highways shall determine to which ward the ward boundary streets shall belong.

1883.

PROPOSAL

FOR CLEANING STREETS, INLETS, AND MARKET HOUSES,
AND REMOVING ASHES AND DEAD ANIMALS.

To the Chief Commissioner of Highways.

DEAR SIR:—We propose to clean the streets, inlets, and market houses, and remove the ashes and dead animals in the following districts, and for the following prices, and in strict accordance with the annexed specifications :

First Ward, First District, Hugh McAnany, 1431 South Eighth street.....	\$8,690
Second Ward, Second District, Oliver Wilson, Seventeenth and Fitzwater streets.....	11,798
Third and Fourth Wards, Third District, Oliver Wilson, Seventeenth and Fitzwater streets.....	17,955
Fifth and Sixth Wards, Fourth District, R. Walter Peterson, 2225 Wallace street.....	21,390
Seventh Ward, Fifth District, Robert Kilpatrick, 714 South Fifteenth street.....	8,500
Eighth and Ninth Wards, Sixth District, R. Walter Peterson, 2225 Wallace street.....	23,440
Tenth Ward, Seventh District, Augustus Ruff, 2124 Cherry street.	12,000
Eleventh and Twelfth Wards, Eighth District, Dennis Mahoney, Ninth and Lehigh avenue.....	25,000
Thirteenth and Fourteenth Wards, Ninth District, James White, 1120 Salmon street	13,970
Fifteenth Ward, Tenth District, Robt. J. Peoples, 1246 West College avenue.....	14,444
Sixteenth and Seventeenth Wards, Eleventh District, R. Walter Peterson, 2225 Wallace street.....	11,470
Eighteenth Ward, Twelfth District, Wm. B. M. Conklin, 1417 Marlborough street.....	12,220
Nineteenth Ward, Thirteenth District, James Brown, 1237 Toronto street.....	10,850
Twentieth Ward, Fourteenth District, Charles Dewees, 1753 Juniata avenue.....	15,900
Twenty-first Ward, Fifteenth District, R. Walter Peterson, 2225 Wallace street.....	3,770
Twenty-second Ward, Sixteenth District, David McMahon, 242 Haines street, Twenty-second Ward.....	4,700

Twenty-third Ward, Seventeenth District, Julius Maier, Richmond street, Station F	3,474
Twenty-fourth Ward, Eighteenth District, Charles Reinhart, 1407 Barclay street.....	9,500
Twenty-seventh Ward, Nineteenth District, Charles Reinhart, 1407 Barclay street.....	9,500
Twenty-fifth Ward, Twentieth District, Dennis Mahoney, Ninth and Lehigh avenue.....	6,000
Twenty-sixth Ward, Twenty-first District, Thos. Smith & Co., 756 South Fifteenth street.....	9,500
Twenty-eighth Ward, Twenty-second District, McMahon & Dolan, 242 Haines street, Twenty-second Ward.....	7,250
Twenty-ninth Ward, Twenty-third District, P. C. McEntee, 1541 Thompson street.....	9,900
Thirtieth Ward, Twenty-fourth District, Henry E. Bickley, 1622 Market street.....	8,400
Thirty-first Ward, Twenty-fifth District, W. B. M. Conklin, 1417 Marlborough street.....	11,340

NOTE.—The party or parties bidding for the above work must fill out each item of their bid, both in writing and in figures, and must sign their name or names, and give their address in full. Bids will be received for any or all of the items, but prices for two or more items must not be grouped in a single amount.

1883.

PROPOSAL.

FOR REMOVING KITCHEN GARBAGE AND OFFAL.

To the Chief Commissioner of Highways.

DEAR SIR :—We propose to remove kitchen garbage and offal in the following districts, and for the following prices, and in strict accordance with the annexed specifications.

First Ward, First District, Hugh McAnany, 1431 South Eighth street	\$ 780
Second Ward, Second District, James Patchell, 1515 Kater street.....	999
Third and Fourth Wards, Third District, John H. Ward, 213 Moore street.....	1,400
Fifth and Sixth Wards, Fourth District, James Noonan, Trenton avenue and Ann street.....	1,850

Seventh Ward, Fifth District, Robert Kilpatrick, 704 South Fifteenth street.....	700
Eighth and Ninth Wards, Sixth District, William Sharkey, 1213 South Twenty-eighth street.....	1,200
Tenth Ward, Seventh District, William Sharkey, 1213 South Twenty-eighth street.....	900
Eleventh and Twelfth Wards, Eighth District, John Noonan, 1121 William street.....	2,974
Thirteenth and Fourteenth Wards, Ninth District, Bernard Mooney 1121 William street.....	3,239
Fifteenth Ward, Tenth District, Robert J. Peoples, 1246 W. College avenue	1,444
Sixteenth and Seventeenth Wards, Eleventh District, George G. Brown, Harrowgate and Nicetown lanes.....	749
Eighteenth Ward, Twelfth District, George G. Brown, Harrowgate and Nicetown lanes.....	774
Nineteenth Ward, Thirteenth District, John F. Pugh, 2409 Huntingdon street.....	790
Twentieth and Twenty-eighth Wards, east of Broad street, Fourteenth District, Heft & Simon, Fifth street and Nicetown lane..	700
Twenty-first Ward, Fifteenth District, John F. Pugh, 2409 Huntingdon street.....	490
Twenty-second Ward, Sixteenth District, Barney Toner, Jr., 89 Franklin street, Twenty-second Ward.....	1,000
Twenty-third Ward, Seventeenth District, Julius Maier, Richmond street, Station F.....	399
Twenty-fourth Ward, Eighteenth District, Anderson & Co., Rittenhouse street, Twenty-first Ward.....	1,800
Twenty-seventh Ward, Nineteenth District, Farrell & Bro., Mount Moriah and Greenway avenues.....	939
Twenty-fifth Ward, Twentieth District, John Noonan, 1121 William street.....	599
Twenty-sixth Ward, Twenty-first District, William Sharkey, 1213 South Twenty-eighth street.....	500
Twenty-eighth Ward, Twenty-second District, John F. Pugh, 2409 Huntingdon street.....	495
Twenty-ninth Ward, Twenty-third District, P. C. McEntee, 1541 Thompson street.....	1,500
Thirtieth Ward, Twenty-fourth District, James Patchell, 1515 Kater street.....	799
Thirty-first Ward, Twenty-fifth District, Dennis Mahoney, Ninth street and Lehigh avenue.....	1,150

NOTE.—The party or parties bidding for the above work must fill out each item of their bid, both in writing and in fig-

ures, and must sign their name or names, and give their address in full. Bids will be received for any or all of the items, but prices for two or more items must not be grouped in a single amount.

1883.

SPECIFICATIONS.

FOR CLEANING STREETS, INLETS, AND MARKET HOUSES,
AND REMOVING ASHES, DEAD ANIMALS, AND KITCHEN
GARBAGE.

All the paved and unpaved streets, alleys, courts, and all streets used for public travel, and all gutters thereon, all gutters under railroad crossings, and all bridges, to be cleaned as hereinafter described. All street crossings, inlets, and approaches thereto, all streets in front of and about all fire plugs, for a radius of five feet and out to the beaten track, to be kept clear of ice and snow. All inlets and gutters in the several Districts, to be cleaned at least once each month, or as much oftener as may be directed by the Department, and to be flushed with hose wherever water is accessible, except the gutters of unpaved and macadamized streets. The grass to be removed from all paved and unpaved streets. The dirt taken from the gutters of unpaved streets, where said dirt is unmixed with filth or refuse matter, to be placed in the centre of such street or streets, or on such other portions of the same as may be directed by the Department. All filth, dirt, and accumulations left on the streets, except by permission, to be removed at once. The streets to be sprinkled in such manner as to lay the dust without creating mud, and all dirt sites or piles shall be swept as well as shovelled. All ashes, sweepings, and rubbish, which shall be placed on the sidewalks, streets, lanes, courts, alleys, or highways, by residents, occupants, or persons having charge of stores, dwellings, and all other buildings (the quantity not to exceed three barrels per week from each building), shall be collected and removed once

each week, and upon days and at regular stated hours to be designated by the Department. The same to be removed in tightly-covered carts, numbered, and with the name of the contractor or contractors, distinctly placed thereon. If any ashes, sweepings, garbage, or rubbish, be thrown into the street, it shall be the duty of the contractor or contractors, to remove the same. Ashes, dirt, or rubbish, which are made in the prosecution of any manufacturing or other business, or building operation, or from the use of any steam engine, to be removed at the expense of the owner thereof. The street dirt and ashes to be deposited in such places as may be authorized or directed by the Department, except such street dirt as may be disposed of by the contractor or contractors, for fertilizing purposes. The dirt collected from the streets and inlets, to be removed in carts or wagons, so constructed that the dirt will not spill, leak, or fall therefrom.

All Market Houses and streets adjacent, to be cleaned and washed twice a week, immediately after the market days, from the first day of March to the first day of December. The floors of the markets, and adjoining streets, to be sprinkled with disinfectant if necessary, after each cleaning, the same to be furnished by the City. All dead animals which may be thrown or placed in the streets, courts, lanes, alleys, or highways of the City, to be removed at once. All streets on which there are horse railways leading out of Depots, to be cleaned between the tracks for a distance of three squares from such Depot, daily, from April 1st to December 1st.

Contractors will be required to call regularly at all dwellings and other buildings, and remove promptly, neatly, and orderly, from the yards, alleys, or premises, not less than three times each week, between the first day of May and the first day of November, and not less than once each week during the remaining months of the year, all *Kitchen Garbage* and *Offal*. The garbage must be collected and removed at regular stated hours in each locality. Adequate notice shall be given by the contractor, by public advertisement in the

Public Ledger and Record, and by personal notice to housekeepers, of the days and the hours that the said garbage will be collected in the respective localities. The contractor or contractors, will not be permitted to mix, collect, or remove the garbage with the ashes. Garbage to be collected and removed in water-tight vehicles, well covered, numbered, and with the name of the contractor or contractors distinctly placed thereon, and must be so arranged that none of the contents shall fall, leak, or spill therefrom.

Security on the contracts for the above-mentioned work to be the full amount of the bid—real estate entered of record. The contractor or contractors, to whom the said contracts may be awarded, must be prepared to execute the same within five days after having received from the Chief Commissioner of Highways notice of the same having been so awarded, and must produce certificate that ten per cent. of the total amount of his or their contract, has been deposited with the City Treasurer, in accordance with Section 2, Ordinance, December, 22, 1881. In case any contractor or contractors, fail after forty-eight hours' notice from the Department of Highways, to do any work coming within the limits of these specifications, the Chief Commissioner of Highways shall declare the contract forfeited, or shall proceed to do such neglected work by day's labor, pay-rolls for which shall be approved by the Committee on Highways, and payment for same to be taken from the amount set aside for the afore-mentioned contract. For the purpose of these specifications all macadamized streets shall be regarded as paved streets, except that there shall be no flushing. Payments will be made upon the following dates, and in the following proportions, viz.: April 1, one quarter of the amount of the contract; July 1, one quarter; October 1, one quarter; the balance to be paid on the 30th day of December.

A deduction shall be made from quarterly payments, equivalent to the proportion of time work has not been done under the contract, by reason of non-award of said contract, till a

date subsequent to the first of the year 1883. Prices named in the proposal shall be for the full year, but payments will be made for the portion of the year remaining after the date of the contract.

Each bill for quarterly payment under the contracts shall be accompanied by a sworn certificate, signed by the Assistant Commissioner, that the work has been fully performed in strict accordance with the contract and specifications.

The contractor or contractors, will be required to place his, or their name and a number, on each cart or wagon used in the performance of their contract, under such rules as may be prescribed by the Department.

No bid will be received from any contractor who has defaulted on any previous contract with the City, and no contractor who has so defaulted shall act as foreman, superintendent, or agent for the contractor, or have any interest in the contract.

No contractor or contractors will be permitted to sublet his or their contract, or any part thereof.

Bids must state price for single Districts, for the removal of *Kitchen Garbage* and *Offal*, apart from the removal of ashes, street cleaning and other work indicated by the specifications.

Other bids must state prices for single Districts for the removal of *Ashes*, *Sweepings*, and *Dead Animals*; the *Cleaning* of *Streets* and *Inlets*, and all other work indicated by the specifications, except the removal of kitchen garbage and offal.

Blank forms, envelopes, etc., to be furnished by the Department. Copy of the specifications must accompany each bid, and no bid will be received unless upon blanks, and enclosed in envelopes furnished by the Department. The entire work under these specifications shall be subject to the direction and approval of the Chief Commissioner of Highways, who is also to decide when the streets cannot be cleaned on account of snow and ice.

No bid will be considered unless the bidder is present and assents in person, or by authorized agent, to the bid when the bids are opened.

1883. STREET CLEANING DISTRICTS.

FIRST DISTRICT.

All that portion of the city embraced in the First Ward, including Broad and Wharton streets and Passyunk avenue. Except when covered with ice or snow, all streets and inlets from Wharton street to Snyder avenue, to be cleaned once each week. The remaining streets and inlets, to be cleaned twice each month. Any of the said streets and inlets to be cleaned oftener, if necessary, and required by the department.

SECOND DISTRICT.

All that portion of the city embraced in the Second Ward, including Broad and Christian streets and Passyunk avenue. Except when covered with ice or snow, all streets and inlets to be cleaned once each week. Any of the said streets and inlets to be cleaned oftener, if necessary, and required by the department.

THIRD DISTRICT.

All that portion of the city embraced in the Third and Fourth Wards (the Third Ward including Broad, Fitzwater, Catharine, German, and Mead streets; and the Fourth Ward including Broad and South streets). Except when covered with ice or snow, all streets and inlets to be cleaned once each week, except South street, which shall be cleaned three times each week. Any of the said streets and inlets to be cleaned oftener, if necessary, and required by the department.

FOURTH DISTRICT.

All that portion of the city embraced in the Fifth and Sixth Wards (the Fifth Ward including Chestnut and Seventh streets, and the Sixth Ward including Seventh, Franklin, and Vine streets). Except when covered with ice or snow, all inlets to be cleaned once each week; and all streets to be cleaned once each week, except the following, viz.: Chestnut street, which

must be cleaned once each day before 9 o'clock A. M. Market street, and all other streets running from Market to Walnut streets, Arch, Race, Vine, and Third street, from Vine to Walnut street, to be cleaned three times each week before 9 o'clock A. M. Front street, from Lombard to Walnut street, and Front street, from Race to Vine street, Dock street, from Front to Second street, Spruce street, from Front to Third street, shall be cleaned three times per week, at hours directed by the Department, from June 1 to October 1. Any of the said streets or inlets to be cleaned oftener, if necessary, and required by the department.

FIFTH DISTRICT.

All that portion of the city embraced in the Seventh Ward, including Spruce street. Except when covered with ice or snow, all streets and inlets to be cleaned once each week. Any of said streets or inlets to be cleaned oftener, if necessary, and required by the department.

SIXTH DISTRICT.

All that portion of the city embraced in the Eighth and Ninth Wards (the Eighth Ward including Chestnut street, and the Ninth Ward including Arch street). Except when covered with ice or snow, all inlets to be cleaned once each week, and all streets twice each week, except Chestnut street, east from Broad street, which must be cleaned once each day before 9 o'clock A. M. Arch street, east from Broad street, Eighth and Ninth streets, from Market to Vine streets, Twelfth street, from Market to Arch street, and Filbert street, from Eleventh to Twelfth street, which must be cleaned three times each week, Eighth and Arch streets to be cleaned before 9 o'clock A. M. Any of the streets or inlets to be cleaned oftener, if necessary, and required by the department.

SEVENTH DISTRICT.

All that portion of the city embraced in the Tenth Ward, including Vine street. Except when covered with ice or snow,

all inlets to be cleaned once each week, and all streets to be cleaned twice each week, except the following, viz.: Race and Vine streets, from Broad street, eastward, and Eighth and Ninth streets, from Arch to Vine streets, which must be cleaned three times each week, Eighth street to be cleaned before 9 o'clock A. M. Any of the streets or inlets to be cleaned oftener, if necessary, and required by the department.

EIGHTH DISTRICT.

All that portion of the city embraced in the Eleventh and Twelfth Wards (the Eleventh Ward including Third and Poplar streets, the Twelfth Ward including Sixth and Poplar streets). Except when covered with ice or snow, all inlets to be cleaned once each week, and all streets to be cleaned twice each week, except the following, viz.: Callowhill street, and Front and Third streets, from Vine to Callowhill street, which must be cleaned three times each week. Any of the said streets or inlets to be cleaned oftener, if necessary, and required by the department.

NINTH DISTRICT.

All that portion of the city embraced in the Thirteenth and Fourteenth Wards (the Thirteenth Ward including Tenth and Poplar streets, the Fourteenth Ward including Broad and Poplar streets). Except when covered with ice or snow, all inlets to be cleaned once each week, and all streets to be cleaned twice each week, except the following, viz.: Callowhill street, east from Broad street, and Eighth and Ninth streets, from Vine to Callowhill street, which must be cleaned three times each week, Eighth street to be cleaned before 9 o'clock A. M. Any of the streets or inlets to be cleaned oftener, if necessary, and required by the department.

TENTH DISTRICT.

All that portion of the city embraced in the Fifteenth Ward, including Poplar street. Except when covered with ice or

snow, all inlets to be cleaned once each week, and all streets to be cleaned twice each week. Any of the streets or inlets to be cleaned oftener, if necessary, and required by the department.

ELEVENTH DISTRICT.

All that portion of the city embraced in the Sixteenth and Seventeenth Wards (the Sixteenth Ward including Girard avenue and Sixth street, the Seventeenth Ward including Oxford and Sixth streets). Except when covered with ice or snow, all streets and inlets to be cleaned once each week, or oftener, if necessary, and required by the department.

TWELFTH DISTRICT.

All that portion of the city embraced in the Eighteenth Ward, including Frankford avenue, Laurel, and Norris streets. Except when covered with ice or snow, all streets and inlets to be cleaned once each week, or oftener, if necessary, and required by the department.

THIRTEENTH DISTRICT.

All that portion of the city embraced in the Nineteenth Ward, including Germantown avenue, Sixth street, and Lehigh avenue. Except when covered with ice or snow, all streets and inlets to be cleaned once each week, or oftener, if necessary, and required by the department.

FOURTEENTH DISTRICT.

All that portion of the city embraced in the Twentieth Ward, including Broad street, Montgomery avenue, Eleventh street, and Susquehanna avenue, and the Twenty-eighth Ward, east of Broad street. Except when covered with ice or snow, all streets and inlets to be cleaned once each week, or oftener, if necessary, and required by the department.

FIFTEENTH DISTRICT.

All that portion of the city embraced in the Twenty-first Ward, including Wissahickon avenue. Except when covered

with ice or snow, all inlets to be cleaned once each month, and all streets to be cleaned once each month, excepting the paved or macadamized streets or alleys and inlets thereon, which shall be cleaned twice each month, excepting Ridge or Manayunk avenue, which shall be cleaned once each week. Any of said streets or inlets to be cleaned oftener, if necessary, and required by the department.

SIXTEENTH DISTRICT.

All that portion of the city embraced in the Twenty-second Ward. Except when covered with ice or snow, all inlets to be cleaned once each month, and all streets to be cleaned once each month, except the paved or macadamized streets or alleys and inlets thereon, which shall be cleaned twice each month, excepting Germantown avenue and the inlets thereon, which shall be cleaned once each week. Any of said streets or inlets to be cleaned oftener, if necessary, and required by the department.

SEVENTEENTH DISTRICT.

All that portion of the city embraced in the Twenty-third Ward. Except when covered with ice or snow, all streets and inlets in the built-up portion of said ward to be cleaned twice each month; in other portions of said ward, to be cleaned once each month. Any of said streets and inlets to be cleaned oftener, if necessary, and required by the department.

EIGHTEENTH DISTRICT.

All that portion of the city embraced in the Twenty-fourth Ward. Except when covered with ice or snow, all paved streets and inlets to be cleaned once each month, except the following streets, and inlets thereon, viz.: Lancaster avenue, from Market street to Hestonville (Fifty-second street); Baring street, from Thirty-first street to Forty-first street; Spring Garden street, from Thirty-first street to Forty-first street; Haverford street, from Thirty-first street to Forty-third street; Thirtieth street, from Market street to end of pavement;

Thirty-second street, from Market street to Arch street;
 Thirty-ninth street, from Market street to Lancaster avenue;
 Thirty-third street, from Market street to Haverford street;
 Fortieth and Forty-first streets, from Market street to Girard avenue, which streets, and inlets on same, to be cleaned once each week. Any of said streets and inlets to be cleaned oftener, if necessary, and required by the department.

NINETEENTH DISTRICT.

All that portion of the city embraced in the Twenty-seventh Ward, including Market street. Except when covered with ice or snow, all paved streets and inlets to be cleaned once each month, except the following streets, and inlets thereon, viz.: Market street, from the bridge to Forty-third street; Chestnut street, from and including the bridge, to Forty-second street; Locust street, from Thirty-sixth street to Fortieth street; Walnut street, from Thirty-third street to Forty-third street; Spruce street, from Woodland avenue to Fortieth street; Woodland avenue, from Market street to Forty-fifth street; Thirtieth street, from Walnut street to Market street; Thirty-second street, from Chestnut street to Market street; Thirty-ninth and Fortieth streets, from Woodland avenue to Market street; Thirty-third street, from South street to Market street, which must be cleaned once each week, and snow, ice and sleet to be removed from the footways of Chestnut Street Bridge immediately after the cessation of storm. Any of said streets and inlets to be cleaned oftener, if necessary, and required by the department.

TWENTIETH DISTRICT.

All that portion of the city embraced in the Twenty-fifth Ward, including Broad street and Germantown avenue. Except when covered with ice or snow, all streets and inlets in the built-up portion of said ward to be cleaned twice each month; in other portions of said ward, to be cleaned once each month, except Lehigh avenue, from Frankford avenue to Richmond

street; Frankford avenue, from Lehigh avenue to Allegheny avenue, and Richmond street, from Lehigh avenue to Allegheny avenue, which must be cleaned once each week. Any of said streets or inlets to be cleaned oftener, if necessary, and required by the department.

TWENTY-FIRST DISTRICT.

All that portion of the city embraced in the Twenty-sixth Ward, including Washington avenue, Ellsworth street and Gray's Ferry road. Except when covered with ice or snow, all streets, from South to Morris streets, to be cleaned once each week; the remaining streets and inlets to be cleaned twice each month. Any of said streets and inlets to be cleaned oftener, if necessary, and required by the department.

TWENTY-SECOND DISTRICT.

All that portion of the city embraced in the Twenty-eighth Ward, from the east side of Broad street, including School lane, Wissahickon, Roberts and Germantown avenues. Except when covered with ice or snow, all inlets to be cleaned once each month, and all streets to be cleaned once each month, except the macadamized streets or alleys and inlets thereon, which must be cleaned twice each month, excepting Germantown and Ridge avenues, and all streets south of Diamond street and east of Ridge avenue, and all streets between Broad and Sixteenth streets, south of Cumberland street, and streets between Twenty-fifth street and Ridge avenue, from Diamond street to Lehigh avenue, and inlets thereon, which must be cleaned once each week. Any of said streets and inlets to be cleaned oftener, if necessary, and required by the department.

TWENTY-THIRD DISTRICT.

All that portion of the city embraced in the Twenty-ninth Ward, including Montgomery avenue. Except when covered with ice or snow, all streets and inlets to be cleaned once each week, or oftener, if necessary, and required by the department.

TWENTY-FOURTH DISTRICT.

All that portion of the city embraced in the Thirtieth Ward, including South street. Except when covered with ice or snow, all streets and inlets to be cleaned once each week, except South street, which shall be cleaned three times each week, or oftener, if necessary, and required by the department.

TWENTY-FIFTH DISTRICT.

All that portion of the city embraced in the Thirty-first Ward, including Frankford and Lehigh avenues. Except when covered with ice or snow, all streets and inlets to be cleaned once each week, or oftener, if necessary, and required by the department.

The cleaning of the Penrose or Rope Ferry Bridge, to be included in the First District.

The cleaning of the bridges over the Schuylkill river at South and Chestnut streets, to be included in the Nineteenth District.

The cleaning of the bridge over the Schuylkill river at Market street, to be included in the Sixth District.

The cleaning of Fairmount Bridge to be included in the Tenth District.

The cleaning of Girard Avenue Bridge, to be included in the Twenty-third District.

The above bridges to be cleaned once each week, or oftener, if required by the department.

HIGHWAY DEPARTMENT.

ESTIMATE FOR APPROPRIATION, 1884.

Items.	For	Amount asked.	Total.
1	OFFICERS' SALARIES, as follows :		
	Chief Commissioner.....	\$4,500	
	Chief Clerk.....	1,800	
	Six Assistant Commissioners (each \$1,800).....	10,800	
	License Clerk.....	1,500	
	Assistant License Clerk.....	900	
	Two Assistant Clerks (each \$900).....	1,800	
	Miscellaneous Clerk.....	900	
	Messenger.....	720	
	Six Superintendents of streets (each \$900).....	5,400	
	Twelve Superintendents, each \$75 per month while employed, say ten months.....	9,000	
	Superintendent of Bridges.....	1,800	
	Janitor.....	480	
	Office boy.....	300	
	Total		\$39,900
2	Paving intersections.....		20,000
3	Repairing paved streets.....		300,000
4	REPAIRING STREETS WITH IMPROVED PAVEMENT, as follows :		
	Diamond street, west of Broad street.....	\$50,000	
	Fairmount avenue, west of Broad street.....	50,000	
	Locust street, east and west of Broad street.....	70,000	
	Christian street, west of Broad street.....	50,000	
	Ridge avenue.....	50,000	
	Eighth street.....	50,000	
	Arch street.....	100,000	
	Around Public Buildings.....	50,000	
	Ninth street, front of new Post Office.....	3,000	
	Sundry small streets.....	27, 00	
	Total		500,000
5	Repairing and maintaining unpaved streets, macadamized streets, roads, trunks, drains, and bridges not exceeding eight feet span.....		50,000
5½	RE-SURFACING MACADAMIZED ROADS, as follows :		
	Ridge Avenue, Roxborough	\$ 5,000	
	Chelton avenue, west of Hancock street.....	5,000	
	School lane, west of Germantown avenue.....	7,000	
	Wissahlekon avenue, south from Chelton avenue.....	4,000	
	Mill street, east of Germantown avenue.....	7,000	
	Oxford, or Old Second street, pike.....	4,000	
	State road, north of Bridesburg.....	6,000	
	Lamb Tavern road and Twenty-second street.....	7,000	
	Broad street, north of Diamoud street.....	4,000	
	Baltimore pike.....	1,000	
	Total.....		50,000
6	Grading streets and roads.....		50,000
7	General repairs to bridges.....		25,000
8	SPECIAL REPAIRS TO BRIDGES, as follows :		
	Willets road, near Ashtou road, Twenty-third Ward....	\$5,000 00	
	Byberry road, east of Byberry pike, Twenty-third Ward	500	
	Byberry road, west of Somerton, Twenty-third Ward....	1,800	
	State road, at Mechanicsville, Twenty-third Ward.....	250	
	Dunean road, south of Fox Chase road, Twenty-third Ward.....	800	
	Powdermill lane and Frankford ereck, Twenty-third Ward.....	1,800	
	Bridge street and Frankford creek, Twenty-third Ward	1,100	

Items	For	Amount asked.	Total.
8	Orthodox street, over Frankford creek, Twenty-third Ward.....	\$3,500	
	Orthodox street and new channel, additional required in lieu of old masonry.....	6,000	
	Front street and Richmond R. R., Twenty-fifth Ward...	2,500	
	Fifth street and North Penn R. R., Twenty-fifth Ward..	1,500	
	Fifth street and Wingohocking creek, Twenty-fifth Ward.....	400	
	Sixth street and Riehmond R. R., Twenty-fifth Ward...	1,300	
	Broad street and Riehmond R. R., Twenty-fifth Ward...	4,700	
	Germantown avenue and Riehmond R. R., Twenty-fifth Ward.....	14,000	
	Frankford road and Gunners' run, Twenty-fifth Ward.	500	
	Cedar street and Gunners' run, Twenty-fifth Ward.....	1,000	
	Thorps' lane, west of York road, Twenty-second Ward..	1,600	
	Pulaski avenue and Riehmond R. R., Twenty-second Ward.....	23,000	
	Germantown avenue and Cresheim creek, Twenty-second Ward.....	10,000	
	Fountain street canal, Twenty-first Ward.....	2,500	
	Ridge avenue and Wissahiekon creek, Twenty-first Ward.....	26,000	
	Huntingdon street and Gunners' run, Thirty-first Ward	2,600	
	Cumberland street and Gunners' run, Thirty-first Ward	2,550	
	York street and Gunners' run, Thirty-first Ward.....	1,800	
	Norris street and Gunners' run, Eighteenth Ward.....	2,000	
	Riehmond street and Gunners' run, Eighteenth Ward...	35,000	
	Girard ave. and Schuylkill river, Twenty-ninth Ward...	25,000	
	Spring Garden st. and Schuylkill river, Fifteenth Ward	22,000	
	South street bridge, Schuylkill river, Twenty-seventh Ward.....	85,000	
	Cobbs' creek and Darby road. Twenty-fourth Ward.....	1,000	
	Total.....		\$306,700
9	Printing, advertising and stationery.....		6,000
10	Insurance on bridges.....		1,500
11	Incidentals, office and yard expenses.....		5,000
12	Street index boards.....		1,500
13	Repairs to meadow banks, First and Twenty-sixth Wards.		500
14	Repairs to streets along passenger railways.....		3,000
15	Salaries of bridge watchmen.....		16,770
16	REPAIRS TO SEWERS AND INLETS:		
	Repairs to sewers not exceeding four feet in diameter...	\$12,000	
	Repairs to main sewer at Mill creek.....	10,000	
	“ “ “ Fairmount and Delaware avenues.....	3,000	
	Repairs to main sewer at Reed street and Delaware ave.	2,500	
	Embankment over main sewer at Venango street and Delaware avenue.....	600	
	Embankment over main sewer at Snyder and Delaware avenues.....	4,700	
	General repairs to sewers exceeding four feet in diameter.....	8,000	
	Substituting iron inlets for old brick inlets.....	4,200	
	Total for repairs to sewers and inlets.....		45,000
17	CONSTRUCTION OF MAIN SEWERS, viz.:		
	For intercepting sewer (Manayunk).....	\$500,000	
	For sewer at Fifth and Clearfield streets.....	15,000	
	For sewer at Ellsworth street and Schuylkill river.....	8,000	
	For sewer at Powelton avenue and Schuylkill river.....	50,000	
	For sewer at Forty-sixth and Sansom and Spruce streets	17,000	
	Mill creek sewer at Forty-sixth, and Sansom and Market streets.....	48,000	
	For sewer at Dauphin street (West Cohocksink).....	10,000	
	For sewer at Vienna street and Delaware avenue.....	14,000	
	For sewer at Laurel street and Delaware avenue.....	48,000	
	For sewer at Westmoreland street, outlet of Kensington avenue.....	70,000	

Items.	For	Amount arked.	Total.
17	For sewer extension, Hart creek sewer, at Indiana avenue and Leamy street.....	\$25,000	
	For sewer on Twenty-fourth street, Sedgeley avenue and Huntingdon street.....	12,000	
	For dredging and extending Aramingo canal.....	13,000	
	Total.....		\$830,000
18	Constructing branch sewers, inlets and manholes.....	\$60,000	
19	Ventilating, relining and perfecting old sewers.....	25,000	
20	Crossing, gutter and tramway stone.....	50,000	
21	Carriage hire and keep of horses for Chief Commissioner....	1,000	
22	Carriage hire and keep of horses for Assistant Commis- sioners and Bridge Superintendents.....	3,500	
23	Grading, curbing, paving and repairing footways.....	10,000	
24	Cleaning streets, removing ashes and garbage.....	325,000	
25	Oil, coal and engineer's stores, Penrose Ferry Bridge.....	1,500	
26	Grade, curb and gutter stakes for paving and preliminary estimates, and levels for grading streets.....	9,000	
27	Emergencies.....	5,000	
28	Stone and iron cross gutters.....	5,000	
	Total.....		\$2,745,870
	NEW BRIDGES:		
	Pennsylvania avenue and Poplar street.....	35,000	
	Ontario street and P. G. and N. R. R.....	13,000	
	Thompson street and Richmond Railroad.....	125,000	173,000
	Total.....		\$2,918,870

HIGHWAY DEPARTMENT.

AMOUNTS APPROPRIATED FOR THE YEAR 1884.

Items.	For	Amount appropri'ted.	Total.
1	FOR SALARIES OF OFFICERS OF THE DEPARTMENT:		
	Chief Commissioner	\$4,500	
	Six Assistant Commissioners (each \$1,800).....	10,800	
	Chief Clerk.....	1,800	
	Two assistant clerks (each \$900).....	1,800	
	Miscellaneous clerk.....	900	
	License clerk.....	1,170	
	Assistant License Clerk.....	900	
	Messenger	720	
	Six superintendents of streets (each \$900).....	5,400	
	Twelve superintendents, each \$75 per month while em- ployed say ten months.....	9,000	
	Superintendent of bridges.....	1,800	
	Janitor	480	
	Office boy.....	300	
	Total.....		\$39,570
2	For paving intersections of streets.....	\$20,000	20,000
3	For repairs to paved streets, to include repairs over water and sewer connections: <i>Provided</i> , That when a whole square is to be repaved from curb to curb the contractor or contractors shall give security to keep the street in repair for three years.....	150,000	150,000
4	For repaving with Belgian blocks streets occupied by pas- senger railways, the work to be done under the pro- visions of the ordinance of June 27, 1883.....	15,000	15,000
5	For repairing and maintaining unpaved streets, mae- adamized streets, roads, trunks, drains, and bridges not exceeding eight feet span, and constructing new trunks and drains.....	35,000	35,000
5½	For resurfacing macadamized roads.....	15,000	15,000
6	For grading streets and roads.....	40,000	40,000
7	For general repairs to bridges.....	20,000	20,000
8	For repairs to South street bridge	85,000	85,000
9	For printing, advertising, and stationery.....	6,000	6,000
10	For insurance on bridges.....	1,500	1,500
11	For incidentals and office and yard expenses.....	4,000	4,000
12	For street index signs.....	1,000	1,000
13	For repairing meadow banks, to include repairs to the banks of Hollander's creek, in the First and Twenty- sixth Wards.....	500	500
14	For repairing and repaving streets in which passenger railway tracks are laid.....	3,000	3,000
15	For salaries of four watchmen on Penrose Ferry bridge, six on South street bridge, four on Market street bridge, four on Callowhill street bridge, two on Girard avenue bridge, at \$648 each; two on Falls bridge, at \$600 each; one on Bridesburg bridge, at \$648; one on Orthodox street bridge over Frankford creek, at \$360; and two engineers on Penrose Ferry bridge, at \$900 each.....	16,975	16,975
16	For repairing, altering and extending sewers and inlets, and substituting iron inlets for old brick inlets, and trapping and re-trapping inlets, and cleaning sewers...	20,000	20,000
17	For the construction of the main intercepting sewer to drain Manayunk.....	100,000	100,000
18	For the construction of branch sewers, inlets, and man- holes: <i>Providing</i> , There shall be no extra compensation paid for the construction of inlets on streets of a width of sixty feet or under: <i>Provided, also</i> , That the contract shall contain a condition that the work shall be ap- proved by the Chief Engineer and Surveyor, and the Chief Commissioner of Highways, before warrants shall be approved by the City Controller.....	40,000	40,000

Items.	For	Amount appropriated.	Total.
19	For ventilating, relining, and perfecting old sewers.....	3,000	3,000
20	For crossing, gutter and tramway stone.....	30,000	30,000
21	For carriage hire and keep of horses for the Chief Commissioner.....	1,000	1,000
22	For carriage hire and keep of horses for the Assistant Commissioners of Highways and the bridge superintendent.....	3,500	3,500
23	For grading, curbing, resetting curbs, paving, and repairing footways.....	5,000	5,000
24	For cleaning the streets and markets, and removing the ashes, kitchen garbage, offal, and dead animals: <i>Provided</i> , That all streets, lanes, and alleys open to the public, and traveled by carts or wagons, shall be cleaned under this item, except that portion of the city cleaned by the Girard Trust: <i>Provided</i> , This item shall include the cleaning of the wide alley between Delaware avenue and Front street, and between Vine and Callowhill streets.....	260,000	260,000
25	For oil, coal, and engineer's stores for bridges.....	2,500	2,500
26	For grade, curb, and gutter stakes, for paving and preliminary estimates and levels for grading streets.....	3,000	3,000
27	For emergencies.....	1,500	1,500
28	For stone and iron cross gutters.....	2, 00	2,500
29	For sprinkling the macadamized portions of north and south Broad street.....	1,000	1,000
	<i>Provided</i> , That all contracts for grading streets shall contain a clause requiring the same to be completed within a period not exceeding one year, and all contracts not so completed shall be void: <i>And further provided</i> , That all bills for paving intersections of streets, or any other work ordered by Councils and chargeable to either of the foregoing items, shall state the locality and under what ordinance or resolution said work was done, and no bill shall be signed by the City Controller unless accompanied by such statement: <i>And provided, also</i> , The Chief Commissioner of Highways shall, and hereby has authority to require such security in excess of the amount already required by ordinance as he may deem necessary for the proper protection of the city: <i>Provided</i> , That the balances remaining to the credit of certain contracts charged against the annual appropriation for the year 1883; and also, the balance of \$10,000 for repairs to South street bridge, in Item 7 of said appropriation, shall not merge: <i>Provided, also</i> , That the Chief Commissioner of Highways shall cause any specified work to be done by day's labor, when, in his judgment, he shall deem the same to be for the best interests of the city, the bills or pay rolls for such work to be approved by the Committee on Highways: <i>Provided further</i> , That the City Controller shall approve such bills for work, labor, or materials, done, made, or furnished prior to 1884 as shall have been approved by the Committee on Highways, the aggregate amount thereof not to exceed \$10,000, the same to be taken from the several items to which they properly belong. And warrants for the same shall be drawn by the Chief Commissioner of Highways, in conformity with existing ordinances. All ordinances or parts of ordinances inconsistent herewith be, and the same are, hereby repealed.	\$925,545	\$925,545

1884.

PROPOSAL

FOR FURNISHING AND DELIVERING CROSSING, GUTTER, AND
TRAMWAY STONES.*To the Chief Commissioner of Highways.*

SIR:—The undersigned offer the following proposals for furnishing and delivering crossing, gutter, and tramway stones, in accordance with the annexed specifications and for the prices named below.

					Cents per linear foot.
24-inch	granite	crossing	stone, (square ends,)	John M. Mack.....	86
24	"	"	" (oblique ends,)	John M. Mack.....	100
20	"	"	" (square ends,)	Daniel McNichol.....	74
20	"	"	" (oblique ends,)	Daniel McNichol.....	85
16	"	"	" (square ends,)	John Maxwell's Sons...	65
16	"	"	" (oblique ends,)	John Mack.....	90
16	"	"	tramway "	 Daniel McNichol.....	62
10	"	"	gutter "		
24	"	flag	crossing " (square ends,)	John Maxwell's Sons...	79 $\frac{3}{4}$
24	"	"	" (oblique ends,)	John Maxwell's Sons...	91
20	"	"	" (square ends,)	John Maxwell's Sons...	62
20	"	"	" (oblique ends,)	John Maxwell's Sons...	71
16	"	"	" (square ends,)	Daniel McNichol.....	54
16	"	"	" (oblique ends,)	John Maxwell's Sons...	63
16	"	flag	tramway "	 John Maxwell's Sons...	58
10	"	"	gutter "	 John Maxwell's Sons...	29

NOTE.—Parties offering proposals must fill out their bids, both in writing and in figures, and must give their names and address in full below. A bond in the sum of \$500 for each item bid for must be filed with the City Solicitor, and certificates of the same must accompany each proposal. The right to reject any and all bids is reserved.

1884.

SPECIFICATIONS

FOR CROSSING, GUTTER, AND TRAMWAY STONES.

All stone shall be sound, hard and durable, and in no way inferior to the best North River flagging. The top surface of each stone shall be straight, even, and in the same plane throughout. All crossing and tramway stones shall have their long edges straight, and parallel to each other, and cut perpendicular to the top surface, so as to lay to one-half inch joints throughout the depth of the stones.

The two shorter edges, or ends, shall be straight, and parallel to each other, and "under-cut" throughout the depth of the stone to a regular bevel of one inch in twelve inches, from right angles to the top surface, so that the stone may be laid to fit the crown of the street and still have the end joints, on top, not exceed one-half inch in thickness.

Bids will be received for crossing stone with oblique ends, so made as to avoid joints exactly in the direction of travel; that is, for parallel ends cut at a bevel of two inches in twelve inches, from a right angle to the sides, and "under-cut" throughout the depth of the stone as above described. Bids will also be received for rectangular top surfaces, or ends cut at right angles to the sides. The top surfaces of all tramway stones and gutter stones are to be rectangular.

Tramway stone are to be uniformly sixteen inches in width, at no point less than six inches in depth or thickness, at no point exceeding nine inches in depth or thickness, and not less than four feet in length.

Gutter stones are to be uniformly ten inches in width, at no point less than five inches in depth or thickness, at no point more than eight inches in depth or thickness, and not less than four feet in length.

Gutter stones throughout their ends and edges, for a depth of not less than three inches, must be dressed perpendicular to the top surface, and to lay to one-half inch joints.

All crossing stone are to be at no point less than five inches in depth or thickness, at no point more than eight inches in depth or thickness, and not less than four feet in length.

Bids will be recived for crossing stone, as above, twenty-four inches wide, twenty inches wide, and sixteen inches wide.

All stone shall be satisfactory to the Chief Commissioner of Highways, and shall be delivered in quantities as ordered by the Department of Highways, and at exact points within the city limits, as so ordered, and promptly, within twenty-four hours of service of such order.

The contractor must give notice to the Department of Highways, on the day of delivery, of the amount delivered at each location, and, within thirty days, furnish the Highway Department with a certificate from the District Surveyor of the amount of stone so delivered.

The appropriation for stone, as above, for the year 1884, is thirty thousand (30,000) dollars. The city does not engage to take a definite amount of any one kind, and reserves the right to reject any or all bids.

Payments will be made monthly as stone are delivered.

Failure at any time to supply material promptly, as ordered, shall authorize the Chief Commissioner of Highways to annul the contract, or, at his option, to procure stone elsewhere at the expense of the contractor.

Security, satisfactory to the Law Department, will be required, and in addition thereto a cash deposit of ten per cent. of the amount of the contract must be made with the City Treasurer, within five days of the award of contract.

Bids will be received for North River flagstone, or flagstone equally good, and other bids for granite stone as above. Preference will be given to granite: *Provided*, That, in the opinion of the Committee on Highways, the relative prices bid for granite are not excessive, and are acceptable.

1884.

PROPOSALS

FOR REPAIRING SEWERS, INLETS, AND INLET-NECKS, AND
CLEANING SEWERS AND INLET-NECKS, FOR THE YEAR 1884.

To the Chief Commissioner of Highways:

SIR:—The undersigned offer the following proposals to repair all sewers, inlets, and inlet-necks, clean all sewers and inlet-necks, and do all work required in the following districts, under the annexed specifications, during the year 1884, and in strict accordance with said specifications, and with the distinct understanding and consent that awards of contract cannot be made till sufficient appropriations therefor have been made by City Councils; and that bids herein offered shall hold good and be binding till awards of contracts are made, or the bids rejected, if done before February 1, 1884.

21st, 22d, 28th, and 29th Wards, M. C. Hong, 1905 N. Twentieth St., \$1,873.

16th, 17th, 18th, 19th, 20th, } M. C. Hong, 1905 N. Twentieth St., \$3,333.
23d, 25th, and 31st Wards, }

5th, 6th, 7th, 8th, 9th, 10th, 11th, } John M. Mack, 1823 S. Fifth St. \$3,000.
12th, 13th, 14th and 15th Wards }

1st, 2d, 3d, 4th, 26th, and } Wm. Armstrong, 1424 Christian St., \$3,000.
30th Wards, }

24th and 27th Wards, William H. H. Achuff, 4327 Aspen St., \$1,200.

NOTE.—Parties offering proposals must fill out their bids both in writing and in figures, and must give their names and address in full. Bids will be received for any or all of the districts above named, but two or more districts must not be grouped under one price. A bond in the sum of five hundred (500) dollars for each district bid for, whatever may be the amount of the bid, must be filed with the City Solicitor, and a certificate of the same must accompany each proposal. The right to reject any or all bids is reserved.

1884. SPECIFICATIONS

FOR REPAIRING SEWERS, INLETS, AND INLET-NECKS, AND
CLEANING SEWERS AND INLET-NECKS, FOR THE YEAR 1884.

1. All sewers not exceeding four (4) feet in their least diameter shall be put in good repair, and maintained in good repair throughout the year 1884.

2. All inlets, inlet-necks, man-holes, and well-holes shall be put in good repair, and maintained in good repair throughout the year 1884. Should such repairs involve rebuilding to line and grade, trapping, retrapping, rebuilding in part or whole, or any other work, or the furnishing of any new material, the same shall be done, but the contractor will not be required to tear out and remove an inlet, and substitute one of another class (like a No. 1 for a No. 2), or an iron inlet for a brick inlet).

3. All broken and all obstructed inlet-necks shall be promptly cleaned and put in good repair.

4. All broken and all obstructed sewers, whose least diameter does not exceed four (4) feet, shall be promptly cleaned and put in good repair.

5. All orders from the Highway Department to clean sewers, whose least diameter does not exceed four (4) feet, shall be attended to promptly, completely, and faithfully.

6. All work and material shall be satisfactory to the Highway Department, and in no way inferior to that required in the specifications for the construction of new sewers, inlets, and inlet-necks.

7. The contractor must give his address, and must call each morning and night at said address for orders.

8. All orders from the Highway Department, whether delivered to the contractor in person, or by mail, must receive attention, on the ground, within twenty-four (24) hours of the date of said order.

9. In cases of broken sewers, inlets, or inlet-necks, the necessary barricades, red lanterns, and danger signals shall be erected at once, and maintained till the completion of repairs.

10. Failure at any time to promptly, fully, and faithfully observe these specifications, to furnish all necessary material and implements, to remove all condemned material and rubbish, and to employ competent and sufficient force for the prompt and faithful completion of all the work, to the satisfaction of the Highway Department, shall authorize the Chief Commissioner of Highways to procure material and tools, and do the work at the expense of the contractor, or, at the option of the said commissioner, to annul the contract.

11. On April 1st, and on the 1st of each month thereafter, payments of one-twelfth of the full amount of the contract will be made; the balance will be paid at the expiration of the contract.

12. Real estate security in one-half the amount of the contract will be required, and a cash deposit of ten (10) per cent. of the contract shall be made with the City Treasurer, within five (5) days of award of contract.

13. For the purpose of these specifications, it is understood that each ward includes the full width of all streets forming its northern and western boundaries; and, in case of any dispute, the Chief Commissioner of Highways shall determine to which ward any street belongs.

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1884.

PROPOSALS

FOR THE MAINTENANCE OF UNPAVED PUBLIC HIGHWAYS,
MACADAMIZED PUBLIC HIGHWAYS, AND SMALL BRIDGES
AND DRAINS, FOR THE YEAR 1884.

To the Chief Commissioner of Highways.

SIR:—The undersigned offer the following proposals for repairing and maintaining unpaved public highways, macadam-

ized public highways, and small bridges and drains, under the annexed specifications, during the year 1884, and in strict accordance with said specifications, and with the distinct understanding and consent that award of contract cannot be made till sufficient appropriation therefor has been made by City Councils, and that bids herein offered shall hold good and be binding till awards of contract are made, or the bids rejected, if done before February 1, 1884.

1st Ward, Hugh McNeill, Ninth and Buck road.....	\$947 50
2d Ward, Hugh McNeil, Ninth and Buck road.....	947 50
2d, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 28th, 29th, 30th, and 31st Wards, Charles Dewees, 4031 Germantown avenue.....	2,395 00
21st Ward, Aug. Herman, 437 Conarroee street.....	2,444 00
22d Ward, Chestnut Hill (north of Washington lane), Mc- Carthy & Toner, 238 Haines street.....	2,240 00
22d Ward, Germantown (south of and including Washington lane), McMahan & Dolan, 242 Haines street.....	2,850 00
23d Ward (north of Township Line road), John Humburg, 811 Callowhill street.....	1,300 00
23d Ward (south of and including Township Line road), Mc- Mahan & Dolan, 242 Haines street.....	2,850 00
25th Ward, McMahan & Dolan, 242 Haines street.....	2,400 00
24th Ward, T. P. Smart, 2045 Christian street.....	2,250 00
27th Ward, Wm. Magee, Seventy-second and Gray's avenue.....	1,300 00

NOTE.—Parties offering proposals must fill out their bids both in writing and in figures, and must give their names and address in full. Bids will be received for any or all of the districts above named, but two or more districts must not be grouped under one price. A bond in the sum of five hundred (500) dollars for each district bid for, whatever may be the amount bid, must be filed with the City Solicitor, and a certificate of the same must accompany each proposal. The right to reject any or all bids is reserved.

1884.

SPECIFICATIONS

FOR THE MAINTENANCE OF UNPAVED PUBLIC HIGHWAYS,
MACADAMIZED PUBLIC HIGHWAYS, AND SMALL BRIDGES
AND DRAINS, FOR THE YEAR 1884.

1. All unpaved public highways, including the boundary avenues of the city, shall be put in good repair, and maintained in good repair, throughout the year 1884.

2. The road surface shall be repaired by filling all ruts, washouts, and inequalities, removing all ridges or shoulders between the ditches or gutters and the centre of the road, and raising the centre of the road sufficiently to ensure the ready and quick removal of all surface water from the cartway and the footways, and sufficiently to make an inclination from the centre of the road to the ditches or gutters, of not less than one-half inch to one foot.

3. All projecting stones, loose stones, stumps, sticks, and rubbish of all kinds shall be removed.

4. The cartway shall be repaired with the best material from the sides of the road, or with material not inferior thereto. No sods or mud shall be used for such repairs.

5. Where roads have been previously surfaced with gravel, such gravel shall be gathered or scraped to form a central roadway not less than eighteen feet in width, and so raised and graded as to insure the prompt removal of all surface water, and to make an inclination from the centre to the gutters or ditches of not less than one-half inch to one foot. Additional gravel shall be supplied, if necessary, to complete such central roadway to a width of eighteen feet.

6. Between such central roadway and the gutters, all ruts, washouts, and inequalities shall be filled, and the whole surface graded and sloped to conform to inclinations of one-half inch to one foot, from the centre of the road to the gutters.

7. All macadamized public highways shall be repaired by mending all breaks made for sewer, water, and gas connections,

and for all other purposes, and by filling all ruts, gullies, holes, washouts, and inequalities.

8. The macadam surface shall be so shaped as to insure the prompt removal of all surface water, and to make an inclination from the centre of the road to the gutters of not less than one-fourth inch to one foot, and not more than one-half inch to one foot. The dirt roads on either side of the macadam shall be similarly shaped, all ruts, washouts, and inequalities filled, ridges removed, and the whole properly graded with the best material from the sides of the road, or material not inferior thereto.

9. Repairs to macadam shall be made with hard and durable stone, acceptable to the Chief Commissioner of Highways, and broken to sizes such that the longest diameter of the largest pieces does not exceed three inches. Stone so broken shall be put on in quantities sufficient to completely fill the depressions, and shall then be compacted by rolling or ramming, and at once covered with stone screenings or gravel.

10. Scattered loose stones shall be promptly and frequently gathered and deposited in masses to fill depressions, as above, or removed.

11. It is understood that repairs to macadamized public highways, as herein specified, does not require the general surface of said macadamized roads or streets to be picked or broken throughout, and an entire new surface supplied, but does require that all ruts, washouts, and inequalities, and all breaks for house connections shall be repaired, and that the surface shall be picked sufficiently to properly make such repairs.

12. All culverts, trunks, water courses, ditches, and gutters, shall be opened and cleaned, and where obstructed by dirt, rock, or other material, such matter shall be excavated and removed, unless deemed inadvisable by the Chief Commissioner of Highways.

13. All public drains that cannot properly be denominated sewers or sewer connections, in paved, unpaved, or macadamized public highways, or necessary for the maintenance of said highways, and whether of wood, stone, brick, or other material, shall be put and kept in good repair during the year 1884.

14. All bridges in the public highways not exceeding eight feet clear span, whether of wood, stone, brick, or other material, shall be put and kept in good repair throughout the year 1884.

15. All plank and timber used in the repairs of bridges and drains shall be good, sound, merchantable yellow pine or oak, and all planking used for bridges or drains shall be not less than three inches in thickness, and free from loose knots, shakes, and sap. Repairs shall not be postponed till breaks occur, but shall be made, promptly, whenever decay or wear makes the same advisable, and the contractor will be held responsible for damage resulting by reason of neglect to make repairs in time.

16. On bridge floors where repairs necessitate the introduction of new plank between old and thinner plank, the edges of the new plank shall be trimmed to ease inequalities in thickness.

17. Graded and curbed streets that have been so washed as to undermine the curbstones, or bury the curbstones, shall be repaired in a manner to secure the curbstones in place, provide properly for the drainage, and make the road, from curb to curb, such that it may be safely used for general traffic.

18. Mortar, sods, street dirt, and any material that will decay or shrink badly, shall not be used to repair the public highways. The contractor shall furnish all the material necessary to make the proper repairs, and all material and work shall be satisfactory to the Chief Commissioner of Highways, who, in case of dispute, shall determine when, where, and what new material is required.

19. It is understood that entire new structures, at points where similar structures have not heretofore existed, will not be required under these specifications.

20. The work shall be prosecuted continuously, whenever the weather will admit, till all the public highways are in good repair, care being exercised, however, not to unnecessarily disturb the surface of dirt roads during continued wet weather.

21. All public highways must be in good repair before any payments on account thereof will be made, and when so in repair, one-twelfth the full amount of the contract will be paid on the 1st of May, and on the first of each month thereafter; the remaining balance will be paid on the expiration of the contract.

22. The contractor shall give his address, and shall call daily at said address for orders. Notice from the Highway Department to make any repairs, or do any work, shall receive attention, on the ground, within forty-eight hours.

23. Failure at any time to fully and faithfully supply the material, do the work, and make the repairs, in accordance with these specifications, shall authorize the Chief Commissioner of Highways to supply material, and cause other parties to do the work at the expense of the contractor, or, at the option of said Chief Commissioner, to annul the contract.

24. For the purpose of these specifications, it is understood that each ward, or division of ward, as above, includes the full width of all streets forming its northern and western boundaries, and in case of any dispute, the Chief Commissioner of Highways shall determine to which ward any street belongs. These specifications shall include all highways that may be added during the year 1884, by dedication, grading, or macadamizing.

25. The city reserves the right to contract with any party to grade, pave, macadamize, or gravel the surface of any street or road, or to put on stone, gravel or ashes at any point or points in streets or roads comprehended in these specifications,

and without limiting the liability, under these specifications, of keeping said places or other places in repair.

26. Real estate security in one-half the amount of the contract will be required, and a cash deposit of ten per cent. of the contract shall be made with the City Treasurer, within five days of award of contract.

1884.

PROPOSAL

FOR REPAIRING PAVED STREETS.

To the Chief Commissioner of Highways:

SIR :—The undersigned offer the following proposal to repair and maintain, during the year 1884, all paved streets, except macadamized streets, in the several wards, as follows: and in strict accordance with the annexed specifications, for the sum named opposite each ward, and with the distinct understanding and consent that awards of contracts cannot be made till sufficient appropriations therefor have been made by City Councils, and that bids herein offered shall hold good and be binding till awards of contracts are made or the bids rejected, if done before February 1, 1884.

First Ward, Alexander Armstrong, 1418 Christian street.....	\$7,280
Second Ward, James Donohue, 1422 Edgemont street.....	2,500
Third Ward, James Donohue, 1422 Edgemont street.....	4,000
Fourth Ward, James Donohue, 1422 Edgemont street.....	2,000
Fifth Ward, Wm. H. H. Achuff, 4327 Aspen street.....	3,700
Sixth Ward, John M. Mack, 1823 South Fifth street.....	2,500
Seventh Ward, R. Kilpatrick & Co., 714 South Fifteenth street.....	2,444
Eighth Ward, Wm. H. H. Achuff, 4327 Aspen street.....	2,979
Ninth Ward, R. Kilpatrick & Co., 714 South Fifteenth street.....	2,444
Tenth Ward, Hiram Horter, Jr, 2032 Vine steet.....	2,900
Eleventh Ward, Dennis Mahoney, Lehigh avenue and Ninth street	3,000
Twelfth Ward, Dennis Mahoney, Lehigh avenue and Ninth street..	2,500
Thirteenth Ward, Wm. H. H. Achuff, 4327 Aspen street.....	2,900
Fourteenth Ward, Wm. H. H. Achuff, 4327 Aspen street.....	3,100
Fifteenth Ward, James Donohue, 1422 Edgemont street.....	6,000

Sixteenth Ward, Martin Ulrick, Allegheny av. and Twenty-eighth st.	3,000
Seventeenth Ward, Wm. H. H. Achuff, 4327 Aspen street.....	2,900
Eighteenth Ward, Martin Ulrick, Allegheny av. and Twenty-eighth	5,945
Nineteenth Ward, Alexander Armstrong, 1418 Christian street.....	15,600
Twentieth Ward, Alexander Armstrong, 1418 Christian street.....	9,100
Twenty-first Ward, Alexander Armstrong, 1418 Christian street....	495
Twenty-second Ward, Alexander Armstrong, 1418 Christian street..	495
Twenty-third Ward, Joseph Johnson, 2122 Hancock street.....	5,450
Twenty-fourth Ward, Wm. H. H. Achuff, 4327 Aspen street.....	6,900
Twenty-fifth Ward, Alexander Armstrong, 1418 Christian street....	11,000
Twenty-sixth Ward, James Donohue, 1422 Edgemont street.....	4,900
Twenty-seventh Ward, Wm. H. H. Achuff, 4327 Aspen street.....	3,900
Twenty-eighth Ward, Alexander Armstrong, 1418 Christian street..	9,000
Twenty-ninth Ward, Alexander Armstrong, 1418 Christian street...	11,000
Thirtieth Ward, James Donohue, 1422 Edgemont street.....	4,500
Thirty-first Ward, James Donohue, 1422 Edgemont street.....	5,500

NOTE.—Parties offering proposals must fill out their bids both in writing and in figures, name a gross sum for each ward bid for, must sign their names and addresses in full below, must submit with their bids, and for each ward bid for, a separate certificate that a bond in the sum of \$500 for each ward so bid for has been filed with the City Solicitor. Bids not properly filled out and signed will be rejected, and the right to reject any or all bids is reserved.

1884.

SPECIFICATIONS

FOR REPAIRS TO PAVED STREETS.

1. All repaving or repairing shall be done in a manner, and with material in no way inferior in quality or quantity to that required by present ordinances of Councils, and to the entire satisfaction of the Chief Commissioner of Highways.

2. Any defects or deficiencies in quantity or quality, shall be made good by the contractor, and all condemned material shall become the property of the contractor, who shall forthwith remove the same and remove all dirt and rubbish.

3. All repaving shall be done on good sharp gravel, or good sharp and coarse sand, extending to a depth, at all points, of not less than 16 inches from the top of the finished pavement, and the contractor shall make sure that this amount exists wherever he does work. Ashes or cinders shall in no case be used within said 16 inches. Where gravel, satisfactory to the Chief Commissioner of Highways, exists in place, the contractor will not be required to replace it with new gravel.

4. All cobble stones shall be acceptable to the Chief Commissioner of Highways, and culled to the requirements of the ordinance of June 12, 1868.

5. The paving stones shall be set truly upright, in close contact, and so arranged as to break joints and give a top surface of stone as nearly complete throughout as possible, and with as small joints as possible, and such that when thoroughly rammed three times with 55 pound rammers, shall be to the true grade and section of the street. When so rammed, the top surface shall be covered with fine sharp gravel, or coarse sharp sand, free from loam and stone, and barely sufficient to fill the interstices or joints; the street shall then be forthwith cleaned of all dirt, refuse, and condemned material.

6. The contractor will be required to make all necessary paving repairs of whatsoever kind they may be, repave water pipe ditches and breaks for house connections, and set or reset where necessary, all gutter stone, crossing stone, and tramway stone. He shall employ skilled and experienced men, satisfactory to the Chief Commissioner of Highways, and shall daily give personal supervision to the work, and shall not sublet the same without the approval of the Committee on Highways.

7. All necessary repairs are to be made at intersections with railway streets, and wherever city inlets are built to admit of the closing of cross-gutters, said cross-gutters shall be repaved to grade.

8. All notices from the Highway Department to repair, shall receive attention within 48 hours, and the contractor

shall at all times employ sufficient force to secure such prompt execution of the work.

9. Failure at any time to promptly, fully and faithfully execute the work, shall authorize the Chief Commissioner of Highways to declare the contract forfeited, or, at his option, to purchase material and tools, and employ other parties to do the work and deduct the cost thereof from the amount set apart for the contract.

10. New gutter stone, tramway stone and crossing stone, will be furnished and delivered within one square of the work, by the city. The contractor shall set the same and cut and dress the ends of old and new stones where required. The ends shall be cut and dressed square to the full depth of the stones, and to joints not exceeding three-eighths of an inch in thickness.

11. For the purpose of these specifications it shall be understood that each ward shall include the full width of all streets forming its northern and western boundary, and provided, that thereby every street shall be included in some ward, and that the Chief Commissioner of Highways shall determine to which ward the ward boundary street shall belong.

12. A cash deposit of 10 per cent. and real estate security for 50 per cent. of the contract, will be required, and must be furnished within five days of the award of contract.

13. Payments will be made as follows: one-third when the streets are put in good repair, and one-twelfth each month thereafter till the completion of the contract, when the balance will be payable.

14. The contractor will not be held accountable for repaving and repairs made by railway companies.

1884.

PROPOSAL

FOR COLLECTING AND REMOVING KITCHEN GARBAGE AND
OFFAL, FOR THE YEAR 1884.

To the Chief Commissioner of Highways :

SIR :—The undersigned offer the following proposal for the above-named work for the year 1884, in strict accordance with the annexed specifications, for the sums named below, and with the understanding and consent that this proposal will hold good till sufficient appropriation for the work is made by City Councils, if made before February 1, 1884 ; and that no deduction be made from the price named herein, by reason of non award of contract, till after the first of the year 1884.

First Ward, Charles McCrossin, 953 Cantrell street.....	\$585
Second Ward, William Sharkey, 1211 South Twenty-eighth street...	500
Third Ward, Robert Kilpatrick, 714 South Fifteenth street.....	543
Fourth Ward, Oliver Wilson, 734 South Fifteenth street.....	767
Fifth Ward, James Noonan, Trenton avenue and Ann street.....	698
Sixth Ward, James Noonan, Trenton avenue and Ann street.....	697
Seventh Ward, William Sharkey, 1211 South Twenty-eighth street	474
Eighth Ward, William Sharkey, 1211 South Twenty-eighth street..	400
Ninth Ward, E. Dooley, 1222 South Twentieth street.....	423
Tenth Ward, Michael Hannigan, 2530 Ellsworth street.....	600
Eleventh Ward, James Noonan, Trenton avenue and Ann street....	791
Twelfth Ward, James Noonan, Trenton avenue and Ann street.....	787
Thirteenth Ward, James Noonan, Trenton avenue and Ann street...	893
Fourteenth Ward, James Noonan, Trenton avenue and Ann street..	990
Fifteenth Ward, Robert J. Peoples, 1246 West College avenue.....	2,333
Sixteenth Ward, John Mooney, 1121 William street.....	449
Seventeenth Ward, John Mooney, 1121 William street.....	449
Eighteenth Ward, Thomas Brown, 1729 Melvale street.....	600
Nineteenth Ward, Thomas Brown 1729 Melvale street.....	650
Twentieth Ward, M. Ulrick, Twenty-eighth st. and Allegheny av...	943
Twenty-first Ward, James Shields, Manayunk.....	399
Twenty-second Ward, Chestnut Hill (north of Washington lane), William Sharkey, 1211 South Twenty-eighth street.....	295
Twenty-second Ward, Germantown (south of Washington lane), D. McMahon, 242 Haines street.....	1,750
Twenty-third Ward, Julius Maier, Station F, Richmond.....	423

Twenty-fourth Ward, East (of Fortieth street), Farrell & Co., Mt. Moriah lane.....	444
Twenty-fourth Ward, West (of Fortieth street), James Aiken, 4416 Lancaster avenue.....	550
Twenty-fifth Ward, William Hendron, 1324 Belgrade street.....	450
Twenty-sixth Ward, East (of Sixteenth street), Frank Grugan, 2036 Catharine street.....	300
Twenty-sixth Ward, West (of Sixteenth street), Frank Grugan, 2036 Catharine street.....	200
Twenty-seventh Ward, William Armstrong, 1424 Christian street....	1,500
Twenty-eighth Ward, North (of Connecting R. R.), Martin Ulrick, Twenty-eighth street and Allegheny avenue.	396
Twenty-eighth Ward, South (of Connecting R. R.), C. A. Carr, 1028 East Somerset street.....	170
Twenty-ninth Ward, C. A. Carr, 1028 East Somerset street.....	484
Thirtieth Ward, Frank Grugan, 2036 Catharine street.....	475
Thirty-first Ward, John Noonan, 1121 William street.....	698

NOTE.—Parties offering proposals must fill out their bids both in writing and in figures, and must give their names and address in full. Bids will be received for any or all the wards and divisions as above, but two or more wards or divisions must not be grouped under one price. A bond in the sum of five hundred (500) dollars, for each ward or division, as above bid for, whatever the amount of the bid, must be filed with the City Solicitor, and certificates of the same must accompany each proposal. A copy of the specifications must be appended to each proposal sheet. The right to reject any or all bids is reserved.

Bidders, or their authorized agent, must be present and assent at the opening of the bids.

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1884.

SPECIFICATIONS

FOR COLLECTING AND REMOVING KITCHEN GARBAGE AND OFFAL, FOR THE YEAR 1884.

1. All kitchen garbage and offal offered by occupants of dwellings or other buildings, shall be regularly and neatly removed.

2. The contractor will be required to call regularly at all dwellings and other buildings, and at parts of dwellings and other buildings occupied by different families, and remove promptly, neatly, and orderly, from the premises, yards, alleys, and highways, all kitchen garbage and offal that may be offered or obtainable. Vessels containing garbage and offal shall be emptied, and returned to the alleys, yards, or premises, without injury and without spilling their contents.

3. Circulars, acceptable to the Chief Commissioner of Highways, giving the name and address of the contractor, and the time for collecting garbage in each street or district, shall be furnished by the contractor, and served by him to each family at the beginning of the contract, and such service shall be, by him, repeated every thirty (30) days thereafter. The contractor shall keep at the office of the Highway Department, at all times, a supply of said circulars.

4. Garbage shall be collected in tight receptacles without spilling, and shall be removed in water tight vehicles that are kept clean, well covered, and legibly numbered and lettered with the name and address of the contractor, and that are constructed and maintained in a manner acceptable to the Chief Commissioner of Highways. Animals attached to the garbage vehicles shall have a bell of suitable size attached to their harness, to give notice of their approach.

5. Contractors, for the purpose of collecting garbage, shall ring or knock at the entrance of premises, and give not less than three minutes time for response before they can be excused for non-collection of garbage.

6. Garbage made or accumulated in the prosecution of any business, or by any hotel, restaurant, or market-house, when not otherwise regularly removed, shall be removed by the contractor at the expense of the proprietor of the place or places above named.

7. From the 1st of May to the 1st of November, garbage shall be collected from all places not less than four times each

week; and from the 1st of November to the 1st of May, shall be collected not less than once each week.

8. Failure at any time to fully and faithfully perform the work in accordance with these specifications, will authorize the Chief Commissioner of Highways, without notice to the contractor, to employ a force and have the work performed at the expense of the contractor, and such failure continued after forty-eight (48) hours notice, in writing, from the Chief Commissioner of Highways, shall authorize the said Commissioner, at his option, to annul the contract.

9. All work shall be subject to the direction, and done to the satisfaction of the Chief Commissioner of Highways.

10. Contractors will be required to give real estate security in half the amount of their contracts, and to deposit with the City Treasurer, in cash, ten (10) per cent. of their contract within five (5) days after award.

11. Each separate ward shall of itself form a single garbage district, except in four cases, as follows:

12. The Twenty-second Ward shall be divided at Washington lane: that portion southeast of Washington lane being termed "Twenty-second Ward, Germantown," and that portion northwest of Washington lane being termed "Twenty-second Ward, Chestnut Hill."

13. Again, the Twenty-fourth Ward shall be divided at Fortieth street: that portion east of Fortieth street being termed "Twenty-fourth Ward east," and that portion west of Fortieth street being termed "Twenty-fourth Ward west."

14. Again, the Twenty-sixth Ward shall be divided at Sixteenth street: that portion east of Sixteenth street being termed "Twenty-sixth Ward east," and that portion west of Sixteenth street being termed "Twenty-sixth Ward west."

15. Again, the Twenty-eighth Ward shall be divided at the Connecting Railroad: that portion south of the Connecting Railroad being termed "Twenty-eighth Ward south," and

that portion north of the Connecting Railroad being termed "Twenty-eighth Ward north."

16. Each ward, or division of ward, as above, shall include the full width of all streets (that is all garbage tributary on both sides of said streets) forming its north and west boundary, and in cases of dispute as to which ward or division any street belongs, the decision of the Chief Commissioner of Highways shall be final.

17. Bids will not be received from parties in default upon any previous contract with the city, and no party in default shall have any interest in any contract, or act as agent therefor.

18. No contract shall be sub-let without the written consent of the Chief Commissioner of Highways, and the approval of the Committee on Highways of the Select and Common Councils.

19. Bidders, or their authorized agents, must be present and assent at the opening of the bids.

20. Bids must be attached to the specifications, must be upon blank forms furnished by the Highway Department, and must state a gross amount for collecting and removing garbage from separate wards, or divisions of wards, as above, for the year 1884.

21. Work shall commence in each district as soon after December 31, 1883, as the contract shall be awarded, and shall continue until December 31, 1884.

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1884. (Revised.) PROPOSAL

FOR CLEANING STREETS, INLETS, AND PUBLIC MARKET
HOUSES, AND REMOVING ASHES AND DEAD ANIMALS.

To the Chief Commissioner of Highways :

SIR :—The undersigned offer the following proposal for the above-named work for the year 1884, in strict accordance with

the annexed specifications, for the sums named below, and with the understanding and consent that this proposal will hold good till sufficient appropriation for the work is made by City Councils, if made before February 1, 1884; and that no deduction be made from the price named herein, by reason of non-award of contract, till after the first of the year 1884.

1st Ward, William Ballenger, 1339 South Fourth street.....	\$7,799
2d Ward, T. P. Smart. 2045 Christian street.....	7,200
3d Ward, Oliver Wilson, 734 South Seventeenth street.....	5,569
4th Ward, Oliver Wilson, 734 South Seventeenth street.....	5,567
5th Ward, E. A. Parker & Co., 601 Sansom street..	8,437
6th Ward, John M. Mack, 1823 South Fifth street.....	9,000
7th Ward, James McHenry & Co., 1924 Catharine street.....	6,223
8th Ward, James McHenry & Co., 1924 Catharine street.....	7,444
9th Ward, James McHenry & Co., 1924 Catharine street.....	8,443
10th Ward, James McHenry & Co., 1924 Catharine street.....	7,333
11th Ward, Alex. Armstrong, 1418 Christian street.....	4,700
12th Ward, R. W. Peterson, 2225 Wallace street.....	6,970
13th Ward, E. A. Parker & Co., 601 Sansom street.....	7,244
14th Ward, E. A. Parker & Co., 601 Sansom street.....	7,443
15th Ward, R. J. Peoples, 1426 West College avenue.....	13,333
16th Ward, Geo V. Kurst & Co., S. E. Cor Tenth and Dauphin sts.,	5,950
17th Ward, James White, 1120 Salmon street.....	5,500
18th Ward, Joseph Johnson, 2122 Hancock street.....	8,100
19th Ward, James Brown, 1237 Toronto street.....	9,200
20th Ward, Dennis Mahoney, Lehigh avenue and Ninth street.....	14,600
21st Ward, John Anderson, Rittenhouse street, Roxborough.....	2,950
22d Ward, Chestnut Hill (north of Washington lane) D. McMahon	
249 Haines street.....	750
22d Ward Germantown (south of Washington lane) D. McMahon,	
242 Haines street.....	2,850
23d Ward, Geo. W. Eckert & Co., 34 North Ninth street.....	2,775
24th Ward, East (of Fortieth street) Edward Ryan, 123 Wyoming	
street.....	5,900
24th Ward, West (of Fortieth street) Joshua Nuttall, 341 South	
Twelfth street	3,900
25th Ward, Geo. W. Eckert & Co., 34 North Ninth street.....	4,595
26th Ward, East (of Sixteenth street) E. A. Parker & Co., 601	
Sansom street.....	4,729
26th Ward, West (of Sixteenth street) James Patchell & Co., 1513	
Kater street.....	3,250
27th Ward, Edward Ryan, 123 Wyoming street.....	5,900

28th Ward, North (of Connecting R. R.) McMahon & Dolan 242	
Haines street.....	2,650
28th Ward, South (of connecting R. R.) P. C. McEntee, 1541	
Thompson street.....	6,500
29th Ward, James Brown	9,400
30th Ward, R. Kilpatrick, 714 South Fifteenth street.....	4,737
31st Ward, Geo. W. Eckert & Co., 34 North Ninth street.....	8,500

NOTE.—Parties offering proposals must fill out their bids both in writing and figures, and must give their names and address in full. Bids will be received for any or all the wards and divisions as above, but two or more wards or divisions, must not be grouped under one price. A bond in the sum of five hundred (500) dollars, for each ward or division, as above bid for, whatever the amount of the bid, must be filed with the City Solicitor, and certificates of the same must accompany each proposal. A copy of the specifications must be appended to each proposal sheet. The right to reject any or all bids is reserved.

Bidders, or their authorized agents, must be present and assent at the opening of the bids.

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1884. SPECIFICATIONS

FOR CLEANING STREETS, INLETS, AND PUBLIC MARKET HOUSES, AND REMOVING ASHES AND DEAD ANIMALS, FOR THE YEAR 1884.

1. All paved and macadamized public highways, whether avenues, streets, lanes, alleys, courts, passage-ways, public places, or public bridges, and all gutters thereon, shall be thoroughly scraped and swept, and all surface dirt, rubbish, leaves, grass, and loose stones, shall be removed, except when prevented by frost, and as often as is hereinafter provided.

2. All matter prejudicial to public health, and all filth, deposited or at any time existing in the cartway or gutters of any unpaved public highway, shall be promptly removed, and said

highway and gutters shall be, at all times, kept clear of such matter and clean, and, at all times, clear of grass and leaves that may in any way obstruct the flow of sewage.

3. All city inlets shall be cleaned and kept clean. They shall be cleaned as often as the contiguous streets, and in no case less than once each month, and at such special times as the Highway Department may direct.

4. Whenever city inlets are cleaned, they shall be first examined to ascertain if they are properly trapped with water, and if found not to be so trapped, such fact shall be at once reported to the Highway Department. Immediately after they have been cleaned, water shall be run in, if necessary, to insure proper trapping.

5. Not less than once each week, during dry weather, all inlets shall be examined to ascertain if the trapping is complete, and if more water is needed to complete the trapping, the same shall be added. Any defect in the construction or condition of any city inlet shall be at once reported to the Highway Department.

6. All gutters in paved and unpaved public highways that may be kept wet by the continued flow of filthy water or sewage, shall be, from the 1st of June to the 1st of November, scraped, brushed out, and thoroughly cleaned (with water, where water is obtainable from fire plugs) twice each week, and from the 1st of November to the 1st of June shall be so scraped and brushed out once each week ; except when prevented by frost or storms.

7. Whenever the highway is in a condition such that sweeping causes dust to rise, it shall be, before being cleaned, evenly sprinkled by sprinkling wagons that are satisfactory to the Chief Commissioner of Highways, and in a manner not to make the surface muddy, and so that dust will not be raised while cleaning.

8. All heaps or accumulations of sweepings, and all dirt from public highways, inlets and gutters, shall be promptly re-

moved, within three (3) hours from the time it is gathered in heaps, and the sites of such heaps or accumulations shall be cleanly scraped and brushed. All material shall be removed in tight carts, with sides and ends reaching above the contents of the cart in a way to effectually prevent spilling or shaking off.

9. All ashes, sweepings, garbage, and rubbish of any kind, scattered or thrown into the highways, and dirt now existing in any paved or macadamized public highway, or that may be hereafter dumped there without authority, shall be promptly removed.

10. Ashes, dirt, or rubbish made in the prosecution of any manufacturing or other business or building operation, or by or for the use of any steam engine, shall be removed at the expense of the proprietor of such business or engine.

11. All ashes, sweepings, and cut grass (in receptacles that can be lifted by one man, and in weight with contents for each receptacle, not exceeding one hundred (100) pounds, and in quantities not exceeding three (3) barrels per week from each building), that shall be placed on the sidewalks in the public highways by the residents, occupants, or other persons having charge of buildings, shall be collected and removed once each week, upon regular days, and at regular hours approved by the Department.

12. The contractor shall issue circulars, giving his name and address, and stating the days for collecting the ashes in each street or section, shall serve a copy of said circular at each and every building, shall repeat such service once every thirty (30) days, and shall at all times keep a supply of said circulars at the office of the Highway Department.

13. All carts for removing ashes shall have high sides and ends, and shall be tight and closely covered with canvas. They shall be legibly numbered, and shall give the name and address of the contractor, and shall at no time be loaded above their sides or ends so as to, by any possibility, scatter their contents

in the highways, or in any way permit the wind to blow dust therefrom. Care shall be exercised not to break or injure the receptacles for ashes, not to soil the sidewalks, and not to scatter any of the contents on the footways or streets.

14. All public market houses shall be thoroughly swept six times each week, and shall be scrubbed with water, immediately after market hours, not less than twice each week, whenever frost does not prevent.

15. All public highways contiguous to public, private and curbstome markets, shall be cleaned six times each week from the first of May to the 1st of November, and from the 1st of November to the 1st of May shall be cleaned not less than three times each week.

16 All inlets receiving drainage from market houses or market stands shall be cleaned not less than twice each week.

17. All streets occupied by passenger railways, for a distance of two squares from car stands or car depots, shall be cleaned not less than twice each week.

18. During the time that cellar or other excavations are being made, all streets over which the excavated material is being hauled, within two squares of said excavation or place of loading, shall be, if deemed necessary by the Chief Commissioner of Highways, cleaned not less than twice each week.

19. During the season of snow and ice, all street crossings, city inlets, and gutters approaching the same, and streets in front of and about all fire plugs, for a radius of five feet, and out to the beaten track, shall be kept clear of ice and snow, and in condition for ready use.

20. All bridges, and all gutters, water courses, and footways on the same, shall be cleaned and kept clean, and when dangerous for public travel by reason of ice, shall be sprinkled with sand or ashes, and swept clear of all coarse pebbles, pieces of coal and coarse material.

21. It is understood and agreed that the term "Public Highways," wherever used, shall include not only those heretofore

declared public, but in addition thereto, from time to time, shall include those that then may be declared public.

22. The several public highways, or parts thereof, in the different sections of the city, shall be cleaned not less frequently than is hereinafter mentioned, and shall have special cleanings whenever occasions arise that, in the opinion of the Chief Commissioner of Highways, make it desirable for such cleaning to be done.

23. In the northern section of the city, viz.: north of Lehigh avenue for the region east of Germantown avenue; and north of the Connecting railroad for the region west of Germantown avenue, all paved or macadamized public highways in the built-up portions shall be cleaned not less than twice each month, and all other portions not less than once each month. The following streets in this northern section shall be cleaned not less than once each week.

24. Richmond street, from Lehigh avenue to Allegheny avenue.

25. Frankford avenue, from Lehigh avenue to Allegheny avenue.

26. Kensington avenue, from Lehigh avenue to Orleans street.

27. Germantown avenue, from Lehigh avenue to Gorgas lane.

28. Manayunk, Main street, from Ridge avenue to Washington street.

29. Baker street, from Green lane to Gay street.

30. Broad street, from Diamond street to Germantown avenue, shall be cleaned not less than twice each month, and for its full width from curb to curb.

31. Ridge avenue, from Montgomery avenue to Dauphin street, and from Clearfield street to Rodman street, shall be cleaned not less than once each week.

32. Ridge avenue, from Dauphin street to Clearfield street, and from Rodman street to Manayunk, Main street, shall be cleaned not less than twice each month.

33. In that section of the city east of the Schuylkill river and south of the northern section, above described, all paved or macadamized public highways in the built-up portion shall be cleaned not less than once each week, and in all other portions not less than twice each month. The following public highways in this section shall be cleaned not less than twice each week :

34. Kensington avenue, from York street to Lehigh avenue.

35. Front street, from Berks street to York street.

36. Front street, from Callowhill street to Spruce street (and about market-houses, as above stipulated).

37. Second street, from Oxford street to Christian street (and about market-houses, as above stipulated).

38. Third street, from Callowhill street to Walnut street.

39. Third street, from South street to German street.

40. Fourth street, from Vine street to Spruce street, and from South street to German street.

41. Fifth street, from Vine street to Walnut street.

42. Fifth street, from South street to German street (and about market-houses, as above stipulated).

43. Sixth street, from Vine street to Spruce street.

44. Passyunk avenue, from South street to German street.

45. Seventh street, from Race street to Walnut street.

46. Eighth street, from Callowhill street to Walnut street.

47. Ninth street, from Green street to Walnut street.

48. Tenth street, from Vine street to Walnut street.

49. Eleventh street, from Vine street to Walnut street.

50. Twelfth street, from Vine street to Walnut street.

51. Thirteenth street, from Vine street to Walnut street.

52. Broad street, from Columbia avenue to Arch street.

53. Fifteenth street, from Arch street to Walnut street.
54. Ridge avenue, from Vine street to Montgomery avenue (and about market-houses, as above stipulated).
55. Twenty-second street, from Spruce street to Hamilton street.
56. Twenty-fifth street, from Hamilton street to Green street.
57. Green street, from Sixth street to Tenth street, and from Broad street to Twenty-fifth street.
58. Hamilton street, from Twenty-second street to Twenty-fifth street.
59. Callowhill street, from Delaware avenue to west end of Schuylkill bridge (and about market-houses, as above stipulated).
60. Vine street, from Delaware avenue to Broad street.
61. Race street, from Front street to Broad street.
62. Arch street, from Front street to Twenty-third street.
63. Filbert street, from Seventh street to Twenty-third street.
64. Market street, from Front street to west end of Schuylkill bridge (and about market-houses, as above stipulated).
65. Sansom street, from Sixth street to Nineteenth street.
66. Walnut street, from Front street to Twenty-third street.
67. South street, from Delaware river to west end of Schuylkill river bridge.
68. The following streets shall be cleaned not less than three times each week :
 69. Broad street, from Diamond street to Columbia avenue.
 70. Broad street, from Arch street to Walnut street, and all streets about Penn square.
 71. Chestnut street, from Front street to Thirtieth street (dirt from Chestnut street to be removed before 8 o'clock A. M., on Tuesdays, Thursdays and Saturdays).

72. West of the Schuylkill river, all paved or macadamized public highways, in the built-up portions, shall be cleaned not less than twice each month, and in all other portions not less than once each month.

73. The following highways shall be cleaned not less than once each week :

74. Lancaster avenue, from Market street to Fifty-second street.

75. Baring street, from Thirty-first street to Forty-first street.

76. Spring Garden street, from Thirty-first street to Forty-first street.

77. Haverford street, from Thirty-first street to Forty-fifth street.

78. Market street, from Schuylkill river bridge to Forty-third street.

79. Chestnut street, from Schuylkill river bridge to Forty-second street.

80. Locust street, from Thirty-sixth street to Fortieth street.

81. Walnut street, from Thirty-second street to Forty-third street.

82. Spruce street, from Woodland avenue to Fortieth street.

83. Woodland avenue, from Market street to Forty-seventh street.

84. Thirtieth street, from Market street to Chestnut street.

85. Thirty-second street, from Market street to Arch street.

86. Thirty-third street, from Haverford street to Walnut street.

87. Thirty-fourth street, from Spring Garden street to Silverton avenue.

88. Thirty-ninth street, from Market street to Lancaster avenue.

89. Fortieth street, from Market street to Girard avenue.

90. Forty-first street, from Market street to Girard avenue.

91. At street and alley intersections, and at all other points where dirt accumulates during storms or at other times, on paved or macadamized public highways, the dirt shall be removed and the streets made clean within twenty-four hours, and without special notice from the Highway Department.

92. Where recent paving or repaving has been done, the surface shall be lightly brushed over, not less than once each week, to evenly distribute the gravel and fill the joints.

93. Dust and surface accumulations of gravel that will form mud or make the gutters filthy, shall be at once removed, and the whole surface made thoroughly clean, within thirty (30) days after the paving or repaving is completed.

94. Failure at any time, to fully and faithfully perform the work in accordance with these specifications, will authorize the Chief Commissioner of Highways, without notice to the contractor, to employ a force and have the work performed at the expense of the contractor.

95. Failure at any time, to fully and faithfully perform the work in accordance with these specifications, forty-eight hours after notice in writing of such failure from the Chief Commissioner of Highways, shall authorize said Commissioner, at his option to annul the contract.

96. Blanks will be furnished by the Highway Department, and the contractor shall fill out daily, in duplicate, on the same, an account of the force employed, loads hauled, and region cleaned by him that day, and shall post one copy of such force account to the office of the Highway Department, and the duplicate copy to the Assistant Commissioner, each evening.

97. All dead animals, deposited or found in any public highway, shall be removed within three (3) hours from the time notice is served in person or at the office of the contractor,

and the contractor shall call at said office, morning, noon, and night, for such orders, or any other orders, that may be sent.

98. Ashes shall be collected regularly throughout the year, and all work herein described shall proceed regularly, and without interruption, in every district, except when prevented by frost or by storms too severe for out-of-door work.

99. In case of interruption in the work from any cause, work shall be resumed on the following day with increased force sufficient to make up for lost time.

100. All work shall be subject to the direction of, and done to the satisfaction of, the Chief Commissioner of Highways.

101. Each contractor shall obtain from the Water Department a permit to use fire-plugs for street-cleaning purposes, and will be required to furnish the usual security for the right to use such plugs, but will not be required to pay a fee to the Water Department in addition to furnishing the bond.

102. Contractors will be required to give real estate security in half the amount of their contracts, and to deposit with the City Treasurer, in cash, ten per cent. of the amount of their contracts within five days of award.

103. Payments will be made in equal monthly installments, except for the months of January, February, and March, when one-half the regular monthly installment shall be paid, and one-half retained, until the whole district is cleaned to the satisfaction of the Chief Commissioner of Highways.

104. If the whole district be cleaned as soon as the weather will admit, the retained portions of the monthly installments shall be then paid.

105. Each separate ward shall of itself form a single street-cleaning district, except in four cases, as follows :

106. The Twenty-second Ward shall be divided at Washington lane : that portion southeast of the northwest house line of Washington lane being termed "Twenty-second Ward, Germantown," and that portion northwest of Washington lane being termed "Twenty-second Ward, Chestnut Hill."

107. Again, the Twenty-fourth Ward shall be divided at Fortieth street: that portion east of the west house line of Fortieth street being termed "Twenty-fourth Ward, east," and that portion west of Fortieth street being termed "Twenty-fourth Ward, west."

108. Again, the Twenty-sixth Ward shall be divided at Sixteenth street: that portion east of the west house line of Sixteenth street being termed "Twenty-sixth Ward, east," and that portion west of Sixteenth street being termed "Twenty-sixth Ward, west."

109. Again, the Twenty-eighth Ward shall be divided at the Connecting Railroad: that portion south of the Connecting Railroad being termed "Twenty-eighth Ward, south," and that portion north of the Connecting Railroad being termed "Twenty-eighth Ward, north."

110. Each ward, or division of ward, as above, shall include the full width of all streets forming its north and west boundaries, and the entire length of all bridges upon said boundaries; and, in cases of dispute as to which ward or division any street or bridge belongs, the decision of the Chief Commissioner of Highways shall be final.

111. Bids will not be received from parties in default upon any previous contract with the city, and no party so in default shall have an interest in any contract, or act as agent therefor. Contracts must not be sub-let without the written consent of the Chief Commissioner of Highways, and the approval of the Committee on Highways of the Select and Common Councils.

112. Bidders must be present and assent in person, or by an authorized agent, at the opening of bids.

113. Bids must be on blank forms furnished by the Highway Department, and must state a gross amount for cleaning separate wards, or divisions of wards, as above, for the year 1884.

114. Work shall begin as soon after December 31, 1883, as the contract shall be awarded, and shall continue until December 31, 1884.

115. Care shall be exercised to economise the use of water from fire-plugs.

116. Water from fire-plugs shall not be run into the gutters until after the gutters have been cleanly scraped or brushed, and no fire-plug shall be opened at one time more than five minutes.

117. Contractors will be held liable for all damage to fire-plugs, and all damages caused by the use of fire-plugs, or resulting in any way by reason of the work.

118. It is hereby understood and agreed that the above specifications are revised so as to require the cleaning of all streets, lanes, and alleys open to the public and travelled by carts or wagons, except such as are cleaned by the Girard Trust.

REPORT
OF THE
BOARD OF EXPERTS
ON
STREET PAVING.

Philadelphia, July 8, 1884.

HON. WILLIAM B. SMITH,
Mayor of Philadelphia.

SIR:—The undersigned respectfully submit the following opinion and report on the subject of street pavements in Philadelphia.

The ordinance, approved June 13, 1884, under which you have requested our opinion on this subject defines the purpose of our investigation in the following words, viz.:

“SECTION 1. *The Select and Common Councils of the City of Philadelphia do ordain, That for the purpose of obtaining professional advice on the subject of paving the streets of Philadelphia, the Mayor is authorized to obtain from three engineers, distinguished for their knowledge and experience of pavements, a written opinion and report concerning the subject of pavements in Philadelphia, which report and opinion shall be by him transmitted to Councils for their action.*”

“SECT. 2. The said opinion and report shall be based upon a careful examination of the present condition of the streets of Philadelphia, and shall point out the defects of the present system of paving, and shall specify what, in the opinion of

the said engineers, is the best system of pavements for Philadelphia, due regard being paid to durability, economy, smoothness, cleanliness, and freedom from noise, and shall further contain an estimate of the cost of such system or systems as they shall recommend."

In order to ascertain "the defects of the present system" we have made a careful examination of the streets, in connection with data furnished to us by the Chief Commissioner of Highways. We find that the present condition of the streets is as follows:

Paved streets,	-	-	-	-	573 miles.
Macadamized streets,	-	-	-	-	44 "
Unpaved streets,	-	-	-	-	443 "
Total,					1,060 miles.

On the paved streets the character of pavements is as follows:

Cobble,	-	9,113,925 sq. yds.	93	per cent.
Granite blocks,		654,148 " "	6 $\frac{2}{3}$	" "
Asphalt,	-	25,396 " "	$\frac{1}{3}$	" "
9,793,469 sq. yds.			100	per cent.

We find further that the cobble pavements, forming ninety-three per cent. of the total are laid upon a bed of loamy gravel without any sand, that the size of the cobble stones is very irregular, varying from three to fifteen inches in size, and that the system of repairs consists in farming out certain districts to the lowest bidder, who contracts to keep the district in good order during the calendar year for a lump sum.

We find in regard to granite block pavements, sometimes called Belgian, that the blocks are laid upon a bed of gravel similar to that above described, that the joints are not cemented, that different qualities of granite have been used with different results, and that these pavements have been greatly injured by being frequently torn up for underground pipes and not properly relaid.

We find in regard to asphalt pavements that a certain amount of sheet asphalt has been laid in accordance with what is generally known as the Washington Specifications, and that this pavement looks well, although it has not been laid a sufficient length of time to properly judge of its character; and, also, that asphalt block pavements have been laid in small amounts here and there, some of which look very well, and some, as on Sixth street, near Walnut, very badly.

We also find in regard to the general character of the streets in Philadelphia that they are unusually narrow for a city of its size, the prevailing total width between houses being either fifty or sixty feet, giving only twenty-six and thirty-four feet respectively for the roadway between curbs; and we also find that these narrow streets are used to an exceptional degree for street railroads, the total length of which amounts to two hundred and three miles, and that where these railroads exist, the carriage-way on each side is reduced to a space of only ten or twelve feet in width, which results in confining the travel in such a manner that vehicles follow each other in lines almost as distinctly marked as the lines of the railroad tracks. These exceptional circumstances have a very important bearing upon the character of pavement to be adopted to meet them.

We find that the macadam is used principally in the suburban sections of the city, such as Germantown, Chestnut Hill, etc., where railroad tracks are not so numerous; although in one instance this class of pavement has been used in the heart of the city (part of Twenty-second street) alongside of railroad tracks. The macadam is usually about ten inches deep, composed principally of a blue gneiss found in the vicinity. Its repairs are farmed out on the same principle as the repairs of the cobble pavements.

Upon the condition of facts above described, we have no hesitation in expressing the following opinions:

First.—That the cobble pavement is the most inferior and the most dangerous to health of all pavements made of stone, and is entirely unfit for use in a large city. It is impossible

to maintain its surface in an even condition, because the stones have an uneven bearing, owing to their irregular shape, and its joints are the receptacle for large amounts of street filth, which cannot be removed from them, and which give forth, under the varying conditions of heat and moisture, a variety of vapors and odors which are injurious to health. As it is probable, however, that for financial reasons a certain amount of this class of pavement will have to remain in Philadelphia for some years to come, we are of opinion that its evils can be greatly mitigated by a change in the methods of repairs as follows:

In making repairs the stones should be broken to as nearly as possible a uniform size, and no stones should be relaid whose least dimension is less than four inches or greatest dimension is more than seven inches, and they should be laid with the greatest dimension vertical.

The red gravel on which the stones are now placed, which we find by actual test to contain about sixteen per cent. of clay, should be used as a sub-foundation only, being spread to the depth of six inches, and thoroughly compacted by ramming or rolling. On this should be spread a layer of clean, sharp, river-washed sand, free from clay, dirt, or impurities of any kind, and in size not less than one-thirtieth of an inch. This sand should be at least four inches in thickness, and will make the only proper bed for the stones. After these have been set, clean, washed pebble should be raked over the surface to fill the joints, and the pavement should then be thoroughly rammed with a heavy rammer.

In making these suggestions, we desire to state, that we recommend that no more new cobble-stone pavements be laid under any circumstances, but we think that if these suggestions are carried out, the existing cobble-pavements can be kept in better order than at present, until such time as they can be replaced with pavements of proper character; and we think that this can be accomplished at less cost than at present, when in consequence of using poor material, the same street has to be relaid two and

even three times in the same year. We also think that the system of farming out the repairs by the year is injudicious, because the contract must necessarily lack that element of distinct specification which is the basis of all good work under contracts.

In our judgment it would be much better to make contracts for repairs, by the square yard of work actually done according to exact specifications, the localities where the work is to be performed, to be pointed out by the proper city official.

Second.—In replacing the cobble-stones, or in laying new pavements, we advise that your choice be restricted to one of the following classes, viz: granite blocks, sheet asphalt, or in exceptional cases, asphalt blocks, the selection among these three being determined by the character of travel, and other conditions which will hereafter be referred to. All of these pavements are perfectly water-proof, which is an indispensable condition for a good pavement.

We are aware that at the present time large amounts of wooden pavements are being laid in London and Paris.

As laid in those cities, upon a foundation of concrete of Portland cement and with blocks of seasoned wood especially treated with preserving compounds—they undoubtedly make a more durable road covering than the wooden pavement which proved so signal a failure in this country several years ago. But according to information received very recently from the French Engineers, it is expected to renew the wood every four or six years, depending on the amount of travel. The first cost of the pavements now being laid in Paris is equivalent to about four dollars per yard, and the contract price for repairs and maintenance is forty-nine cents per yard per annum, the contract being made for eighteen years. This brings the total cost during eighteen years to twelve dollars and eighty-two cents, which is about three times the cost, during the same period, of the pavement which we recommend. On account of its cost, both for construction and maintenance, we do not recommend the wooden pavement for the City of Philadelphia.

We advise that the granite block pavement be used exclusively on all streets where the distance between rail and curb (or, if there be no railroad, between curb and curb) is less than twenty feet, also on all streets in the business section of the city where the travel is unusually heavy—say more than fifty trucks or other heavy wagons per hour, and on all streets, without regard to width or traffic, where the grade is steeper than three in one hundred, except those streets where asphalt blocks are admissible, as hereinafter specified.

We advise that sheet asphalt be laid in spaces near public buildings where quiet is particularly desirable, provided the space is sufficiently wide (more than twenty feet) and the grade not too steep (less than three-one-hundredths) also on streets which are occupied exclusively by dwelling houses and where there are no railroads. As instances of such localities we would cite the space around the new Public Buildings, and on Broad street, Twenty-first street south of Market, portions of Locust street in the vicinity of Rittenhouse square, Diamond street, and other streets of the same character on which there are no railroads. In laying asphalt along railroad tracks, in broad spaces like that surrounding the new City Buildings, a space not less than one foot in width next to the track should be paved with granite blocks, the ends of the blocks tooting into the asphalt.

The asphalt block pavement is somewhat inferior in wearing qualities to the sheet asphalt, but it has great advantages in being cheaper, and in requiring no special plant or skilled labor to lay it. It is well adapted, provided the blocks are properly made, to streets of light travel, occupied solely by residences; but it is proper to state that there is great difference in the quality of these blocks, as ordinarily made, and corresponding risk in adopting them. For heavy traffic they have usually proved a failure. This pavement would be suitable for many of the resident streets of West Philadelphia, but it should not be used on streets where there are railroad tracks, or where the grade is steeper than four in one hundred.

For the suburban streets of Germantown, Chestnut Hill and similar sections, we recommend that macadam continue to be used, at least until the travel on them becomes very much greater than it is at present.

Having thus indicated the general character of the pavements and the conditions which govern the selection and use of each, we will now speak more in detail of the manner in which they should be constructed and laid.

The Granite Block Pavements

Should be laid on a foundation of concrete six inches in thickness; or upon a bed of strong clean gravel of the same thickness, formed to the cross-section of the street, and thoroughly compressed by rolling with a steam roller such as is hereafter described, and all subsidence made good by additional material. In either case the blocks should be bedded in three inches of sharp washed sand, free from clay or other impurities; the joints should be filled with a preparation of clean, dry pebbles (heated if laid in damp weather), and the coal tar product known to the trade as No. 5.

In regard to the foundation, we are of opinion that for ordinary traffic the concrete is unnecessary, provided the work is properly done. Well compacted dry earth is an excellent foundation, provided it is kept dry; and if the joints are properly filled with tar and gravel the pavement becomes absolutely water proof, and no settlement can occur. If, however, the work is not properly executed and the joints not properly filled then water will penetrate to the foundation, and settlement and inequalities will occur. There can be no doubt that the concrete foundation provides against all contingencies. Its use increases the cost of the pavement by about eighty cents per square yard. On streets of the heaviest travel it would doubtless be best to incur this extra expense, although, as previously stated, we do not consider it necessary where such an earth foundation as we have described is kept perfectly dry, and the traffic is not very heavy.

In regard to the quality and size of the blocks, we recommend the Quincy granite as a standard, and all blocks should be equal to this in toughness and hardness, should be of uniform texture, and free from weathering. Hard, basaltic stone, that will take a polish under travel, should be rejected, as should also the softer qualities of granite, and all other gneiss and other laminated stones. The blocks should not be less than three nor more than four and a half inches in thickness, six, seven, or eight inches in depth, according to the amount of travel, and in length about one and a quarter times their depth. A pavement with narrow blocks affords a firmer footing to the horse, and is less noisy than one with wider blocks; but the thickness cannot be reduced below three inches without impairing the strength of the block. Variations in length may be permitted to the extent of two or even three inches, but in depth the blocks should be as nearly as possible uniform; no variation greater than one-half inch being permitted. It is impossible to lay a good pavement with blocks of unequal depths, for under travel the blocks will find a level bearing underneath, and all the inequalities will be on the surface. The blocks should be carefully sorted as to width, and those of the same width be used in the same portion of the street. Each block should be regular in shape, with rectangular edges and smooth faces, having no projections nor depressions greater than one-half inch. We advise that the blocks be laid invariably with tar-cemented joints, so as to make the pavement water-proof. No open-jointed pavement should be laid in a city, on account of the large spaces between the blocks giving access into the soil below for the urine and other foul waters of the street, and giving out fumes not only to the street in summer time, but, through heating and ventilating systems, to the interior of houses in winter. With blocks six inches deep and regular in shape, so that the joints will not be too wide, about three and a half gallons of tar will be required to the square yard, and the cost of this is about twenty-five cents. The advantages of the water-proof joints are fully worth this price.

We recommend that the city purchase the blocks which it may intend to lay several weeks or months in advance, so that they may be carefully inspected on delivery, and all blocks which do not conform to the specifications can be rejected. Separate contracts can then be made for laying the blocks after they have been inspected. We estimate the cost of granite block pavements, laid with tar joints in the manner we have described, as follows, per square yard.

	6 in. deep.	7 in. deep.	8 in. deep.
Cost of blocks, - -	\$1 80	\$2 00	\$2 25
Cost of laying, - -	80	85	90
Total, - - - -	<u>\$2 60</u>	<u>\$2 85</u>	<u>\$3 15</u>

From these prices not less than fifteen cents should be deducted, if the old cobble now on the streets is to be given to the contractors, and 80 cents should be added to them if a concrete foundation is used.

Asphalt Pavements.

Under the name of asphalt, a large variety of mixtures have been laid as pavements, but all those which had any value at all belonged to one of three classes, viz. :

1st. The asphalte comprimé, which is largely used in Paris and other European cities. This is made from an amorphous limestone, naturally and intimately impregnated with bitumen, found in the Vosges Mountains, and in Sicily. It is reduced to powder, heated, placed on a concrete foundation, and then thoroughly compressed by ramming and rolling.

2d. The American asphalt mastic, which is the standard pavement at Washington. This is an artificial compound, made of refined Trinidad bitumen, powdered stones, and sharp sand. The mastic is placed on a concrete foundation when hot and plastic, and thoroughly compressed by rolling.

3d. The coal-tar concretes, improperly called asphalt, in which the foundation was of broken stone and coal-tar, and

the top surface of sand, or fine pebbles, and coal-tar, made into a mastic, spread and rolled substantially as above.

All three of these classes of pavements, when manufactured with skilled labor and laid with proper care, have resulted in good roadways.

The coal-tar pavement is not recommended by us, for the reason that the cementing substance is a product of gas-tar, obtained by interrupting the destructive distillation of that compound, after it has reached a certain point. When placed on the street and subjected to atmospheric influences, a slow and gradual oxidation takes place, by which the tar loses its cementing qualities and becomes inert. The particles of sand then lose their cohesion, and the pavement rapidly disintegrates.

The price of the *asphalte comprimé* in this country at present would not be less than three dollars and fifty cents per square yard. The American asphalt mastic can be laid at a profit for two dollars and twenty-five cents. The *asphalte comprimé* is at times very slippery—an objection to which the American pavement is less subject. There has not yet been sufficient experience as to the comparative cost of repairs of these two classes of pavement to state definitely which is the more durable. Therefore we recommend, at least until further experience, that the American asphalt be used in Philadelphia, in such localities as we have indicated.

A foundation of concrete of the best American hydraulic cement, six inches in thickness, is indispensable for any asphalt pavement. It is, in fact, the pavement itself, the asphalt surface being merely a cushion to break the force of the travel.

The proper preparation and laying of both the *asphalte comprimé* and mastics is so largely a matter of expert manipulation, besides the necessity for purity in the material, that rigorous specifications are liable to be used by an incompetent or dishonest contractor as an excuse for bad work. In order to obviate their difficulty, it has been the practice for several

years in London and other European cities to let contracts for this class of pavement only on satisfactory bond or deposit for maintenance during a period of not less than fifteen years at a specified rate per square yard per annum, the amount of subsidence or dilapidation calling for repairs being rigorously specified, so that it can be clearly understood by the residents on the street as well as the parties to the contract. This system, although it has never been introduced into this country, has met with such uniform success abroad that we recommend it as worthy of the most careful consideration and a full trial.

We recommend that no proposition be entertained looking to the covering of the cobble stones with asphalt or any other compound. Such work will result in nothing but failure, and will create a nuisance on the streets. The reason of this is that the asphalt compound, having no transverse strength of its own, requires an absolutely rigid and unyielding foundation. Cobble stones do not fulfil this condition.

Asphalt Blocks.

These blocks are made of Trinidad bitumen and small particles of lime-stone, mixed together in certain proportions and pressed in a mould under very heavy pressure. They are ready for laying as soon as received from the factory. The size of block usually manufactured is twelve inches long, four inches wide, and five inches deep, and we see no reason to change these dimensions. In regard to its foundation, the same remarks apply as already made in regard to granite blocks, *i.e.*, if the foundation is well compacted and perfectly dry, a concrete bed is unnecessary; but the concrete prevents the chance of poor work. The blocks are of such uniform size that the joints are extremely narrow, and the asphalt on the sides soon unites so as to make the pavement water-proof. Asphalt block pavements can be laid at a profit for two dollars and ten cents per square yard on a foundation of gravel and sand. From this should be made the same deduction for old cobble,

and the same addition for concrete foundation, as previously noted.

Macadam.

In laying new macadam roads in the suburban districts, we recommend that, if the ground be at all springy or damp, a bed of sand or of blast furnace slag, six inches in thickness, be laid as a foundation, and thoroughly rolled. This will provide most effectually for the drainage in the wet season.

The macadam proper should be ten inches in thickness, spread in two layers, each of sufficient thickness to be five inches thick when thoroughly compressed. This compression should be obtained by a steam roller weighing not less than ten tons, and employed for not less than ten hours on each one thousand square yards of each layer. As the use of heavier rollers than can be drawn by horses is necessary for the best type of macadam roads, and as the expense of purchasing a steam road-roller will deter contractors, without assurance of more than one season's work, from bidding on macadam where such purchase is necessary, we recommend the purchase by the city of three rollers, weighing not less than ten gross tons each and not less than two tons per foot run. We estimate the cost of such rollers at about five thousand dollars each. These rollers can be used for compacting foundations for pavements, as mentioned above, as well as for macadam roads, being rented to contractors under proper regulations. In the spring, when the roads are soft, it will be found advantageous to go over all of them, rolling down any projecting stones and bringing the surface to proper shape with fresh materials where any depressions occur, without waiting for the road to be worn out. This, on roads of light travel, with cleaning and watering, will probably be sufficient until fall; on roads of constant and heavy traffic, a roller and store of broken stone should at all times be at the disposal of the engineer in charge, so that the surface can be kept perfect.

For new roads, the bottom layer, which may be of gneiss or

lime-stone, broken to pass through a four-inch ring in their largest dimension, should be placed on a thoroughly compacted bed, as before specified. In rolling this course as above specified, a watering cart and trap screenings should be on hand for use in case the stones begin to roll on each other. When thoroughly compacted, the top course, which should be of tough trap-rock, broken to pass over a one and a quarter inch hole and to pass through a two and a half inch hole, and free from flat pieces or spawls, should be rolled with the same precaution as to water carts and screenings, as above, till thoroughly compacted; when fine, dry screenings should be slowly spread, and rolled in until all interstices are thoroughly filled and a coating of powdered screenings one-quarter inch thick remains on top of the stone, when the road should have a plentiful supply of water from a sprinkler directly in front of the roller, which should be kept in motion till all the surface behind it is "puddled" or has a mottled appearance, when a light coat of screenings will finish the road, and after a few hours drying it can be thrown open to traffic.

The intention of this is to, first, afford a cheap foundation, and, secondly, to make a hard, compact, and, as nearly as possible, homogeneous wearing surface. For this reason trap screenings were specified in the lower coat, as softer screenings, if allowed on the ground, will be worked into the top coat. Any soft material used as "blinding" will reduce the cost and labor of rolling, but will make a softer, dirtier, and more perishable road. On country roads the superior economy, resulting from the use of clay or other soft material, may justify it; but on suburban roads all soft material should be rigorously excluded.

A macadam road should be maintained by thoroughly wetting any depression and rolling in stones from one to one and a half inches in size, in order that general repairs, except on heavily traveled roads, should seldom be necessary. The dust and debris of a macadam road should not be swept off in

dry weather, unless water enough can be afforded to make a very liquid mud. When that is attained, naturally or artificially, a soft revolving broom should be used, with such draft that the heavy debris is not removed. When there is an inconvenient amount of trash on the road, the same broom, with a lighter draft, can be used to remove it. The road should not be scraped, and should be let alone when the mud is not sufficiently fluid.

We estimate the cost of a macadam pavement, laid in the manner we have described, at one dollar and seventy-five cents per square yard.

In conclusion, we submit the following recommendations of a general character :

All contracts for pavements (excluding macadam) should contain a clause by which the contractor guarantees to keep the pavement in good repair for a period of not less than five years from the date of its acceptance by the city, and to insure a compliance with this guarantee, the city should retain ten per centum of its cost until the expiration of the five years term.

No pavement, no matter how well laid, can be kept in proper order if it is constantly disturbed for the purpose of laying or repairing underground pipes. In order to avoid this as far as possible, all drains, gas, water, and other pipes, should be laid, or, if already laid, should be thoroughly repaired, before the pavement is put down. Such openings in the street as subsequently become unavoidable, should be made only by permission of the city official in charge of the streets, and under his direct supervision; and before such permits are granted, the applicant should be required to pay the estimated cost of repairing and relaying the pavement, and these repairs should be made under the immediate direction of the same official, who should be held responsible that they are made properly.

The crown or transverse section of the pavement should be

the arc of a circle, with versine about one-eightieth of the chord, or say for

Streets 26 feet wide, crown 4 inches.
 Streets 34 feet wide, crown 5 inches.
 Streets 50 feet wide, crown 7 inches.
 Streets 70 feet wide, crown 10 inches.

In wider streets these may be slightly reduced when the longitudinal slope exceeds three in one hundred. The distance from top of curb to surface of pavement at the curb should be between five and seven inches, depending on the width of the street.

In cases like that of Locust street, between Sixteenth and Seventeenth streets, where the ground is soft and full of springs, we would advise that "blind" or broken stone drains be laid under the foundation, these drains being connected at their lower ends with drain pipes leading into the nearest sewer or inlet. A concrete foundation should be laid on all such streets as a further protection against settlement. No sewer pipes intended to carry house drainage should be laid with open joints for the purpose of draining the soil. Such pipes would speedily pollute the soil and produce sickness.

The ordinance under which we have made this report requires that the report shall "contain an estimate of the cost of such system or systems as we shall recommend." We have already stated that the cost per square yard of the standard pavements which we recommend, is as follows:

7 inch granite blocks on concrete foundation,	\$3 65
6 inch granite blocks on gravel foundation,	2 60
Sheet asphalt on concrete foundation	2 25
Asphalt block on concrete foundation,	2 90
Asphalt block on gravel foundation,	2 10

Although the existing granite block pavements are not cemented in the joints, yet they are so much better than the cobble pavements, that it is not likely that any plans for re-

laying them will be considered at present. This leaves the 535 miles of cobble pavements, containing in round numbers 9,000,000 square yards, Of this a length of 203 miles is traversed by street railroads, between the rails of which we would advise that the cobble be allowed to remain for the present. This reduces the area by about 600,000 yards, leaving 8,400,000 yards to be repaved. It is not probable that more than 80 miles of streets, say 1,400,000 yards—will fulfill the conditions which we have named as limiting the use of asphalt pavements, and of this not more than one-fourth to one-third should be asphalt block.

We have then 7,000,000 yards remaining for granite blocks, and of this perhaps 1,000,000 yards in the heavy business streets, should be deep blocks laid on concrete.

This gives the data for the following approximate estimate, viz.:

1,000,000 sq. yds. granite block a.,	\$3 65	\$3,650,000
6,000,000 sq. yds. granite block a.,	2 60	15,600,000
1,100,000 sq. yds. sheet asphalt,	2 25	2,475,000
300,000 sq. yds, asphalt block,	2 10	630,000
8,400,000 sq. yds.		\$22,355,000

From this should be deducted the value of 8,400,000 yards of cobble, at fifteen cents, \$1,260,000, leaving the net cost \$21,095,000.

It is estimated that two million dollars could be advantageously expended in each year, in laying about fifty miles of improved pavements so that the cobble stone would be entirely replaced in between ten and eleven years.

These estimates are necessarily general and approximate only. They are given merely for the purpose of stating what will be the probable ultimate cost of replacing the cobble stones. Our estimate of prices per square yard is based upon the actual cost of similar work in other cities during the past

few years, and it may be relied upon as reasonably exact, at the present prices of labor and materials.

Respectfully submitted,

(Signed)

Q. A. GILLMORE,
F. V. GREENE.

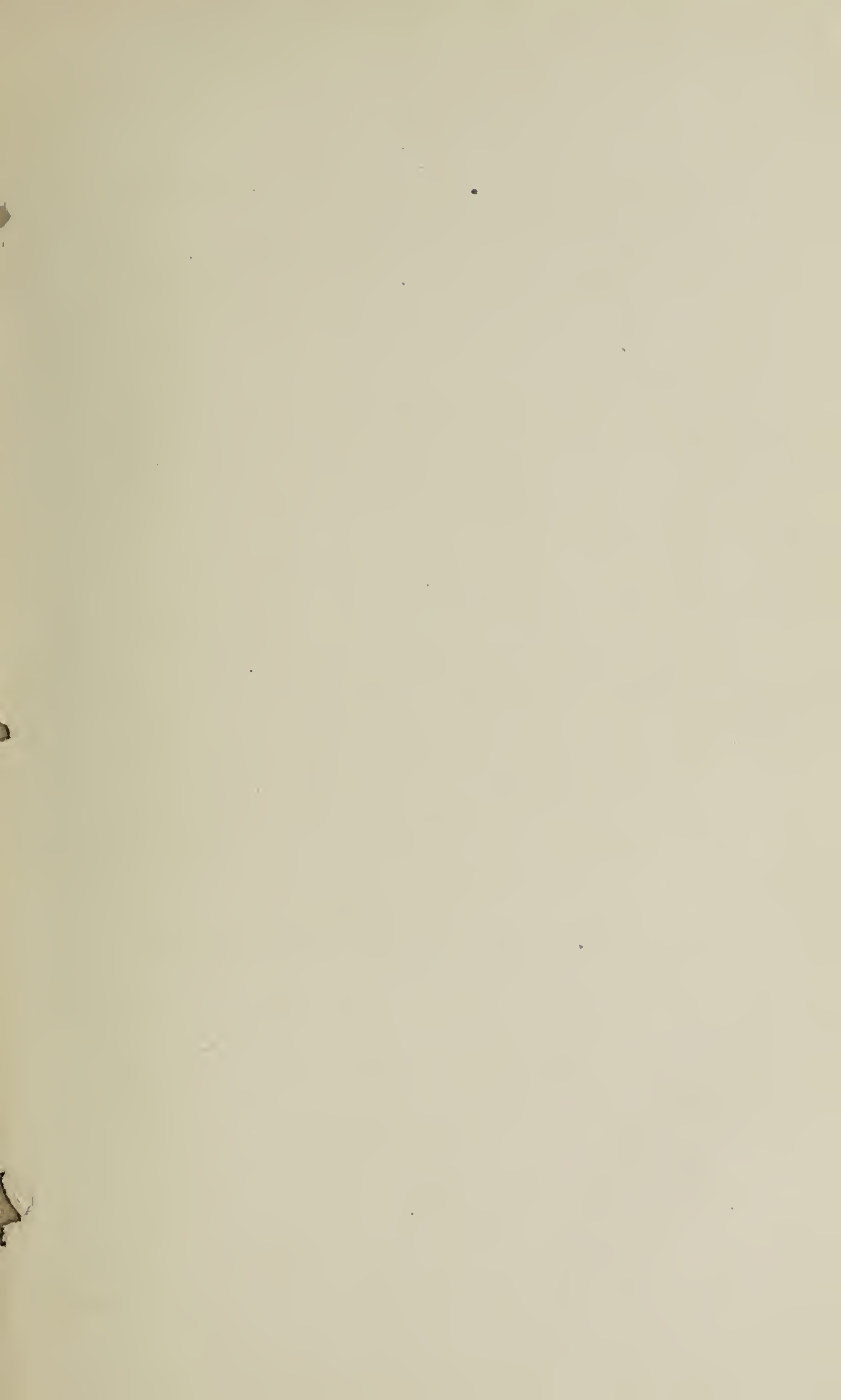
The undersigned agreeing with the above, wishes to add a recommendation that in the case of all pavements except those laid on concrete when the ground is wet or soft, a layer of fine sand or blast furnace slag be placed or rolled under the bed of gravel specified, with the purpose of preventing the subsidence of the gravel into the clay.

Also, for the lanes or alleys in the old part of the city, where water is discharged into the gutters, the use of rock-asphalte mastic made from either one of the following brands, viz.: Val de Travers or *Neuchatel*, *Seyssel*, or the mastics of the *United Limmer Company*. These mastics when properly laid are not disintegrated by hot or other water, and can be laid so hard that wheels following in one track will not injure them. This pavement can be laid on six inches of concrete, one and one-half inches thick, for two dollars and seventy-five cents per square yard, and the gutters will be so smooth that water will not lodge in them as at present.

Very respectfully,

(Signed)

EDWARD P. NORTH.



UNIVERSITY OF ILLINOIS-URBANA



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